FORT BEND
SUBSIDENCE DISTRICT

2023 ANNUAL GROUNDWATER REPORT

Determination of Groundwater Withdrawal and Subsidence in Fort Bend County

by Ashley Greuter, P.G.

Fort Bend Subsidence District Report 2024-01

Fort Bend Subsidence District
Richmond, Texas
www.fbsubsidence.org

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by
Ashley Greuter, P.G.

Fort Bend Subsidence District Report 2024-01

Fort Bend Subsidence District
Richmond, TX
2024

MICHAEL J. TURCO
GENERAL MANAGER

The Fort Bend Subsidence District (District) has been monitoring water use, groundwater levels, and subsidence in Fort Bend and adjacent counties since 1989. Subsidence, the lowering of land-surface elevation, is caused by the depressurization of our aquifers due to the widespread use of groundwater as a primary water source. The mission of the District is to cease ongoing subsidence and prevent the occurrence of future subsidence. As part of this effort, it is important for the District to provide consistent, high-quality information to the public regarding groundwater use, aquifer water levels, and subsidence.

The information contained within this report is the compilation of the largest multi-agency effort in the State of Texas that leverages the resources of both the Fort Bend and Harris-Galveston Subsidence Districts with the City of Houston, the Lone Star Groundwater Conservation District, the Brazoria County Groundwater Conservation District, and the United States Geological Survey. This year local, county, regional, and federal partnerships will publish the 34th volume of this important data compilation. This report is intended to exceed the requirements of section 8834.104 of the District's enabling legislation.

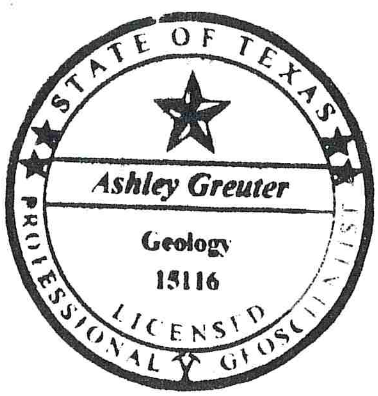
On behalf of the Board of Directors of the Fort Bend Subsidence District, I would like to thank you for your interest in the District. We look forward to continuing to provide timely, accurate, high-quality data and research to inform the District's Regulatory Planning and water planning throughout the region.

Sincerely,

Michael J. Turco
General Manager

Professional Geoscientist Seal

The contents of this report (including figures and tables) document the work of the following Licensed Professional Geoscientist:



Ashley Greuter, P.G. No. 15116

Ms. Greuter was responsible for working on all aspects of the subsidence section of the report including preparation of report figures, tables, and written text. The groundwater level data collection and interpretations were performed by the USGS and are included in the report for informational purposes. The subsidence data were processed and analyzed by Dr. Guoquan Wang at the University of Houston.

Signature

05-21-2024

Date

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Acknowledgments

The compilation of the data and analysis contained within this report would not be possible without the concerted effort of many who contributed to the 2023 Annual Groundwater Report. The author would like to thank the staff of the Fort Bend Subsidence District, including Vivian Jones, Elizabeth Giglio, and Noe Veldanez for their diligent work in collecting water use information and raw GPS data in the field; Dr. Guoquan Wang (University of Houston) for processing and archival of all raw GPS data; and the permittees and owners of over 1,800 permitted wells in the District that submitted detailed water use information contained in this report.

Public Hearing Notice was posted on:	March 22, 2024
Draft Presentation Posted on District Website on:	April 24, 2024
Public Hearing held on:	April 25, 2024
Hearing Examiner:	Helen Truscott
Hearing Record held open for public comment until:	May 3, 2024
Approved by the Board of Directors:	May 22, 2024

Conversions Factors and Datum

Multiply	By	To obtain
inch (in)	2.54	centimeter (cm)
foot (ft)	0.305	meter (m)
mile (mi)	1.609	kilometer (km)
square mile (mi^2)	2.590	square kilometer (km^2)
gallon (gal)	3.785	liter (L)
million gallons per day (MGD)	3785.41	cubic meter (m^3)
million gallons per day (MGD)	3.0688	acre-feet (acre-ft)

List of Acronyms

BCGCD	Brazoria County Groundwater Conservation District
CORS	Continuously Operating Reference Station
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
GRP	Groundwater Reduction Plan
HGSD	Harris-Galveston Subsidence District
LSGCD	Lone Star Groundwater Conservation District
MGD	Million Gallons per Day
NGS	National Geodetic Survey
NOAA	National Oceanic and Atmospheric Administration
NWS	National Weather Service
PAM	Periodically Measured Station
POR	Period of Record
TxDOT	Texas Department of Transportation
UH	University of Houston
USGS	United States Geological Survey

Executive Summary

Groundwater was the primary source of water for municipal, agricultural, and industrial users over the last century. The reliance on groundwater and subsequent subsidence that was caused by its regional development resulted in the creation of the Fort Bend Subsidence District (District) in 1989. The District's mission is to regulate the use of groundwater in Fort Bend County, to cease ongoing and prevent future subsidence that can lead to infrastructure damage and contribute to flooding.

This report comprises the 34th Annual Groundwater Report for the District. Pursuant to District Resolution No. 24-477 passed on February 28, 2024, the Board of Directors held a public hearing at 2:00 p.m. on April 25, 2024. This report provides an overview of the information presented during the Public Hearing, including climatic conditions, groundwater use, groundwater levels and measured subsidence within the District through December 31, 2023.

Climate

Annual variations in precipitation can significantly impact the amount of water used (i.e., total water demand) in the District. Groundwater use patterns fluctuate based on total rainfall received, which results in changes in aquifer water levels and, potentially, in land subsidence. During periods of excessive rainfall, total water demand can decline; conversely, during periods of drought, water use can increase, resulting in declining water levels in the aquifer and increased land subsidence. The 2023 calendar year began with below normal rainfall for half of the National Weather Service (NWS) climate stations analyzed for the region. The year progressed with five out of the eight stations recording below the 1991-2020 average normal precipitation and worsened in the summer months. From August through December, an extreme drought was classified for the region and all climate stations ended 2023 with rainfall accumulations below normal. This was similar to the drought experienced in 2022 as the majority of analyzed climate stations measured below normal rainfall from summer through end of year.

Water Use

Since 1989, water users in the District have been working to change their source water from primarily groundwater to alternative sources of water that will not contribute to subsidence, like treated surface water. The percentage of total water demand sourced from groundwater has decreased slightly from about 60 percent in 1990 to about 51 percent in 2023. The four primary water uses in the District are public supply, industrial, agricultural, and other. Public supply groundwater use remains the largest single-use category at 78.3 million gallons per day (MGD) and accounts for 82 percent of groundwater used in the District.

The District's Regulatory Plan requires permittees in certain areas to convert to alternative water supplies to reduce their reliance on groundwater sources. The main alternative water supply used in our region is surface water sourced from three river basins, the Brazos River Basin, the San Jacinto River Basin and the Trinity River Basin. Total alternative water usage for 2023 was 92.6 MGD, with the Brazos River remaining the single largest source of alternative water, providing a total of 67.1 MGD in surface water supply. Groundwater remains the largest source of water supply within the District as a whole. The total water use for the District was determined to be 188.1 MGD in 2023, which is less than one percent higher than in the previous year.

Groundwater Levels

Annually, since 1990, the United States Geological Survey (USGS) has measured the water level in hundreds of wells throughout the region in cooperation with the District through a joint funding agreement along with additional cities, Harris-Galveston Subsidence District (HGSD) and groundwater conservation districts to monitor and provide reports on groundwater level altitude data for the Chicot/Evangeline (undifferentiated) aquifer. Since aquifer water-level is the best measure of the pressure in the aquifer, this information is also of vital importance to understanding the impact that changes in water use have on the aquifer system and subsidence.

The change in water-levels from 2013 to 2024 include areas of rise within Regulatory Area A such as Sugar Land and Missouri City with over 20 feet in the Chicot/Evangeline (undifferentiated) aquifer as these areas began utilizing alternative water in compliance with the District's Regulatory Plan. In northeastern Fort Bend County, the change in water-levels during this time period had a decline of over 30 feet. These areas are growing rapidly and the conversion to alternative sources of water will not be completed in the District until 2027.

Subsidence

Since the mid-1990s, the District has been utilizing global positioning (GPS) stations to monitor the land surface elevation in the area. Working collaboratively with the University of Houston (UH) researchers, the monitoring network has grown to 190 GPS stations throughout the region that are operated by the District, the HGSD, the UH, the Lone Star Groundwater Conservation District (LSGCD), the Brazoria County Groundwater Conservation District (BCGCD), the City of Houston, the Texas Department of Transportation (TxDOT), and other local entities.

The average annual rate of movement is a useful measure to show the current activity at a GPS station. Subsidence rates greater than 2 centimeters (cm) per year were measured in northeastern Fort Bend County, near Katy and Fulshear. Some southern portions of Regulatory A near the Richmond and Rosenberg area and all of Regulatory Area B show very little subsidence at under half a centimeter per year based on the subsidence rate averaged from 2019 to 2023.

Introduction

The Houston region has relied on groundwater as a primary source of water since the early 1900s. During and following the economic boom of the 1940s, rapid population expansion and increased water use resulted in potentiometric water level declines in the Chicot and Evangeline aquifer of 250 to 300 feet (76 and 91 meters) respectively from 1943 to 1977 (Gabrysch, 1982). The potentiometric surface is the level to which water rises in a well. In a confined aquifer, this surface is above the top of the aquifer unit; whereas, in an unconfined aquifer, it is the same as the water table.

The reliance on groundwater and subsequent subsidence that was caused by its regional development resulted in the creation of the Fort Bend Subsidence District (District) in 1989. The District's mission is to regulate the use of groundwater in Fort Bend County to cease ongoing and prevent future subsidence that can contribute to flooding and lead to infrastructure damage.

Purpose and Scope of Report

This document comprises the 34th Annual Groundwater Report for the District. Pursuant to District Resolution No. 24-477 passed on February 28, 2024, the Board of Directors held the Annual Groundwater Hearing beginning at 2:00 p.m. on April 25, 2024. The Public Hearing was held as an in-person meeting. The public hearing fulfills the requirements of Section 8834.104, Texas Special Districts Local Laws Code, which states that each year, the Board of Directors shall hold a public hearing for the purpose of taking testimony concerning the effects of groundwater withdrawals on the subsidence of land within the District for the preceding year.

Approximately 16 people attended the 2023 Public Hearing including members of the United States Geological Survey (USGS) staff, along with members of the District's staff, two Board members, several interested parties and the public. Those giving testimony were Ashley Greuter of the District and Jason Ramage, Hydrologist, Gulf Coast Programs Office, Texas-Oklahoma Water Science Center, USGS. District staff submitted 14 exhibits including topics of precipitation, groundwater withdrawal, alternative water usage, and subsidence measurements. Mr. Ramage presented nine exhibits including topics of water level altitudes, water level changes, and aquifer compaction.

The record was left open until May 3, 2024. Ms. Truscott asked for additional testimony and comments at the end of the Public Hearing. Public testimony and comments are provided in **Appendix C**.

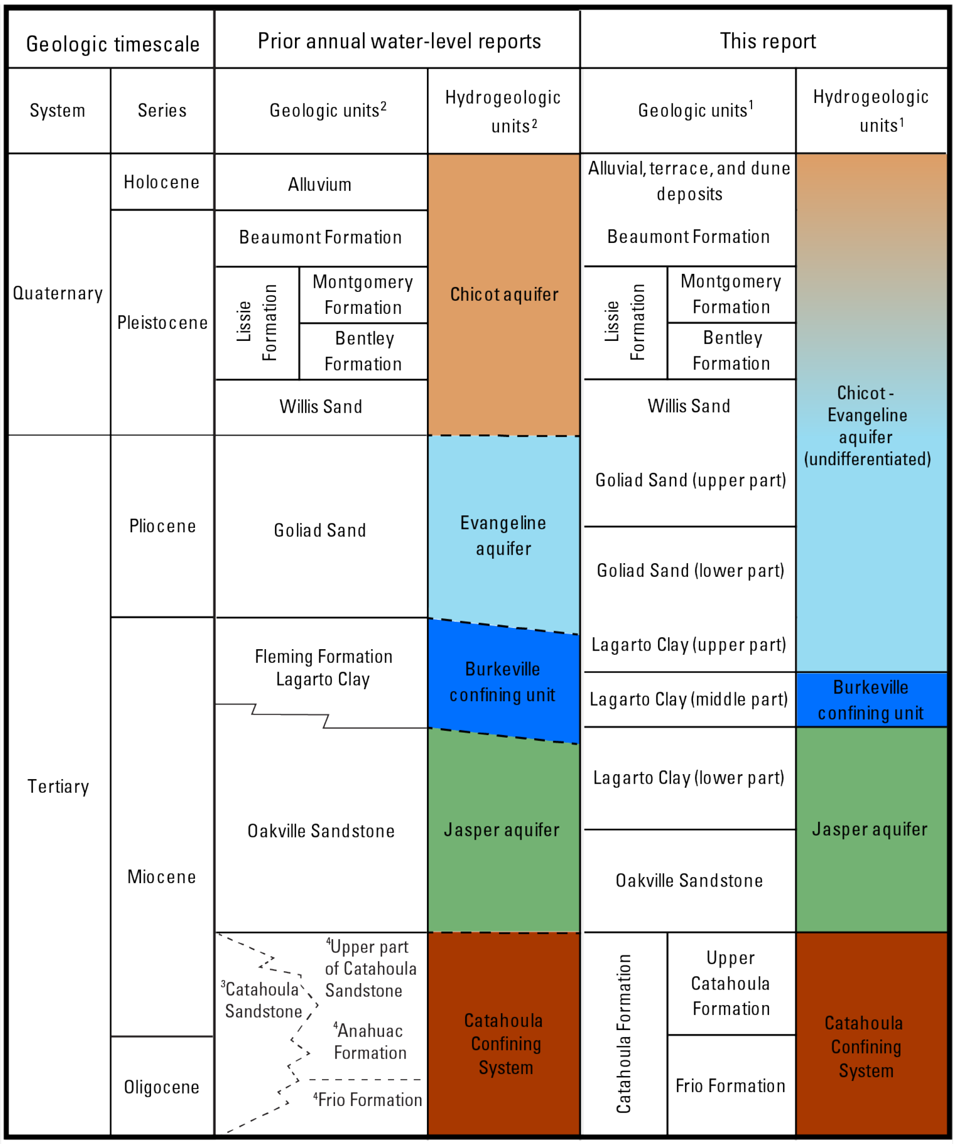
This report provides an overview of the information presented during the Public Hearing, including climatic conditions, groundwater use, groundwater levels and measured subsidence within the District from January 1, 2023, through December 31, 2023. Appendix **A** of this report includes the exhibits presented at the public hearing held on April 25, 2024.

Description of Study Area

The following section provides an overview of the study area, including the hydrogeology and the District's regulatory planning areas.

Hydrogeology

The Gulf Coast Aquifer exists as an accretionary wedge of unconsolidated sediments composed primarily of sand, silt, and clay. Indicative of a transgressive-regressive shoreline, the interbedded sands and clays are not horizontally or vertically continuous at larger than a local scale. From youngest to oldest, these hydrogeologic units include the Chicot, Evangeline, Burkeville Confining Unit, Jasper, and Catahoula Sandstone aquifers (**Figure 1**).



[1]Modified from Young and Draper (2020) and Young and others (2010; 2012)
[2]Modified from Baker (1979)
[3]Located in the outcrop
[4]Located in the subcrop

Figure 1. Updated stratigraphic column of the Gulf Coast Aquifer System in Fort Bend and adjacent counties, Texas (Ramage, et al., 2022).

The two primary water-bearing units most widely utilized within the District are the Chicot and Evangeline aquifers. The Chicot and the Evangeline aquifers comprise the shallow system of aquifers. These aquifers are hydrologically connected, allowing for the free flow of water between the two units. The Chicot and Evangeline aquifers have been combined into an undifferentiated shallow aquifer system called the Chicot/Evangeline (undifferentiated) aquifer in this report (**Figure 1**).

The Jasper aquifer is the deepest primary water-bearing unit, is isolated by the regionally persistent Burkeville confining unit and is mostly undeveloped in Fort Bend County. Currently, one well is completed in the Jasper aquifer in the District and has only been in use on a limited basis. In the region, the Catahoula Sandstone, the deepest water-bearing unit in the Gulf Coast Aquifer system, and the Burkeville confining unit are not utilized as a groundwater supply within the District.

Most of the subsidence that has occurred in the District can be sourced to clay compaction in the shallow water-bearing units associated with long-term water use and the decline in the potentiometric surface. Because of the significant amount of clay material in the primary water-bearing units of the aquifer, the risk of compaction is high in areas where the developed portions of the aquifers are within about 2000 feet of land surface (Yu, et al., 2014) under high stress from groundwater development, and have had sustained potentiometric water level declines when compared to pre-development levels.

Regulatory Planning

The District's Regulatory Plan was developed to reduce groundwater withdrawal to a level that ceases ongoing subsidence and prevents future subsidence within the District. The District utilizes a novel approach to regulating groundwater withdrawal to prevent subsidence by allowing a portion of the total water demand of a groundwater user to be sourced from groundwater. Total water demand is defined as the total amount of water used by an entity from all sources, including groundwater, treated surface water, reclaimed water, etc. The District adopted the most recent Regulatory Plan on January 23, 2013, and it was subsequently amended on June 22, 2022.

The District has historically used regulatory areas to guide groundwater conversion deadlines and regulations. The 2013 Regulatory Plan has subdivided Fort Bend County into two regulatory areas (**Figure 2**). Regulatory Area A includes the northeastern portion of the county, including all of the major cities. Permittees in this area may source no more than 40 percent of their total water demand from groundwater unless operating under a District approved groundwater reduction plan (GRP). Since 2013, permittees operating under an approved GRP can source no more than 70 percent of their total water demand from groundwater and in 2027 this percentage will reduce to no more than 40 percent.

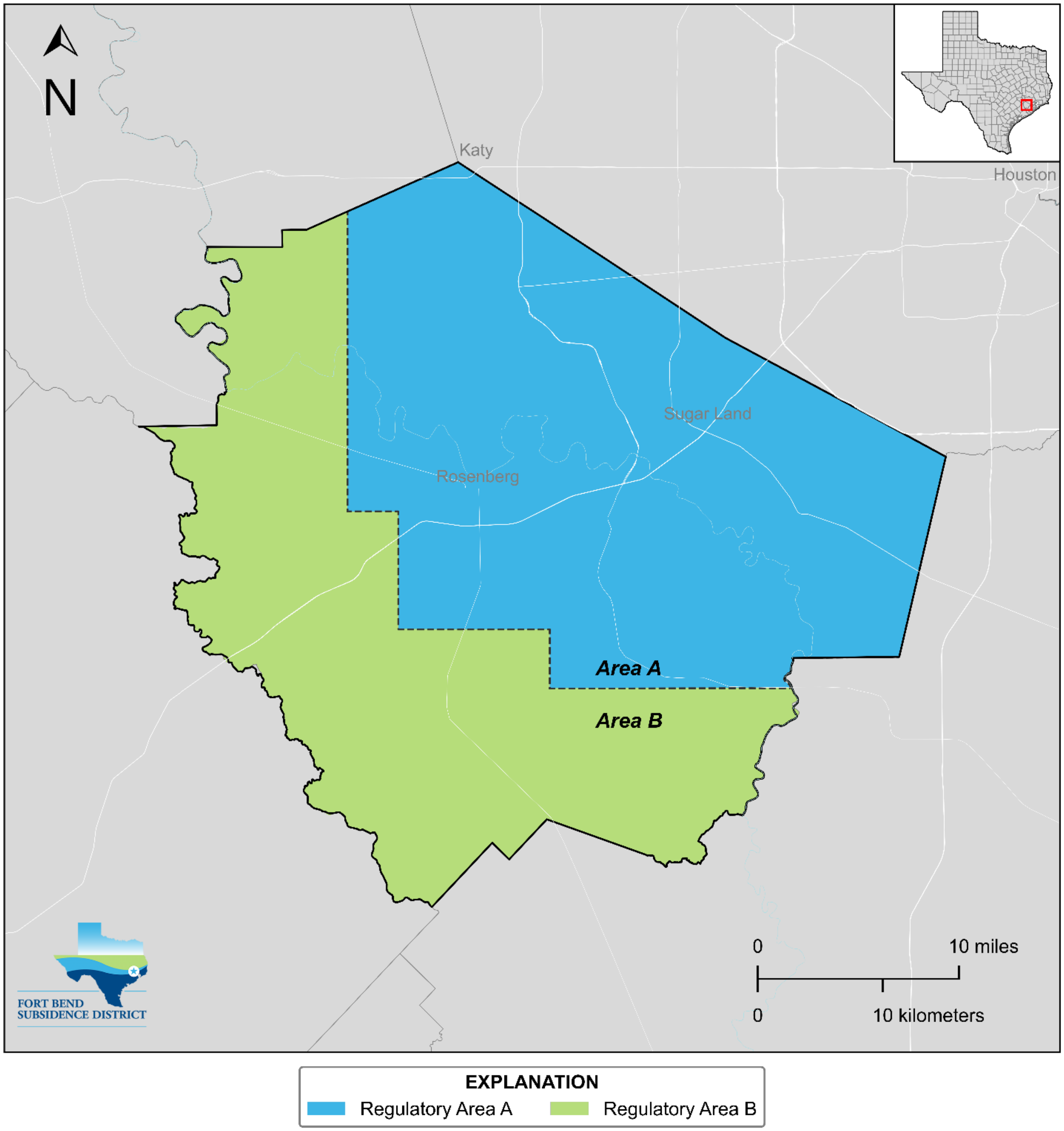


Figure 2. Location of the Fort Bend Subsidence District's Regulatory Areas.

Surficial Hydrology

The District's regulatory plan requires permittees to utilize alternative water supplies in order to reduce their reliance on groundwater sources. The primary alternative water supplies used in our region is treated surface water sourced from three river basins: the Brazos River Basin, the San Jacinto River Basin and the Trinity River Basin (**Figure 3**)**.**

The Brazos River Basin is the second largest river basin in Texas, covering over 45,500 square miles according to the Texas Water Development Board (TWDB). The headwaters of the Brazos River are located near the Texas-New Mexico border and the river travels over 800 miles to discharge into the Gulf of Mexico near Freeport, Texas. The Brazos River Authority manages the eleven reservoirs within this basin, eight of which are owned by the Brazos River Authority and three are owned by the U. S. Army Corps of Engineers (Region H Water Planning Group, 2016).

The San Jacinto River Basin is the smallest river basin in Texas, covering almost 4,000 square miles (Texas Water Development Board, 2024). Lake Conroe and Lake Houston are the two water supply reservoirs located within the San Jacinto River Basin. Lake Conroe is jointly owned by the City of Houston and the San Jacinto River Authority. The San Jacinto River Authority operates Lake Conroe and provides water supply to Harris and Montgomery Counties. Lake Houston is owned by the City of Houston and operated by the Coastal Water Authority.

The Trinity River Basin covers almost 18,000 square miles with headwaters of the basin located in north central Texas (Texas Water Development Board, 2024). The Trinity River flows through the Dallas-Fort Worth metroplex, traversing 550 miles until the river discharges into Trinity Bay near Anahuac, Texas. There are numerous reservoirs located on the Trinity River which are owned and operated by several different agencies, including Lake Livingston which is owned and operated by Trinity River Authority.

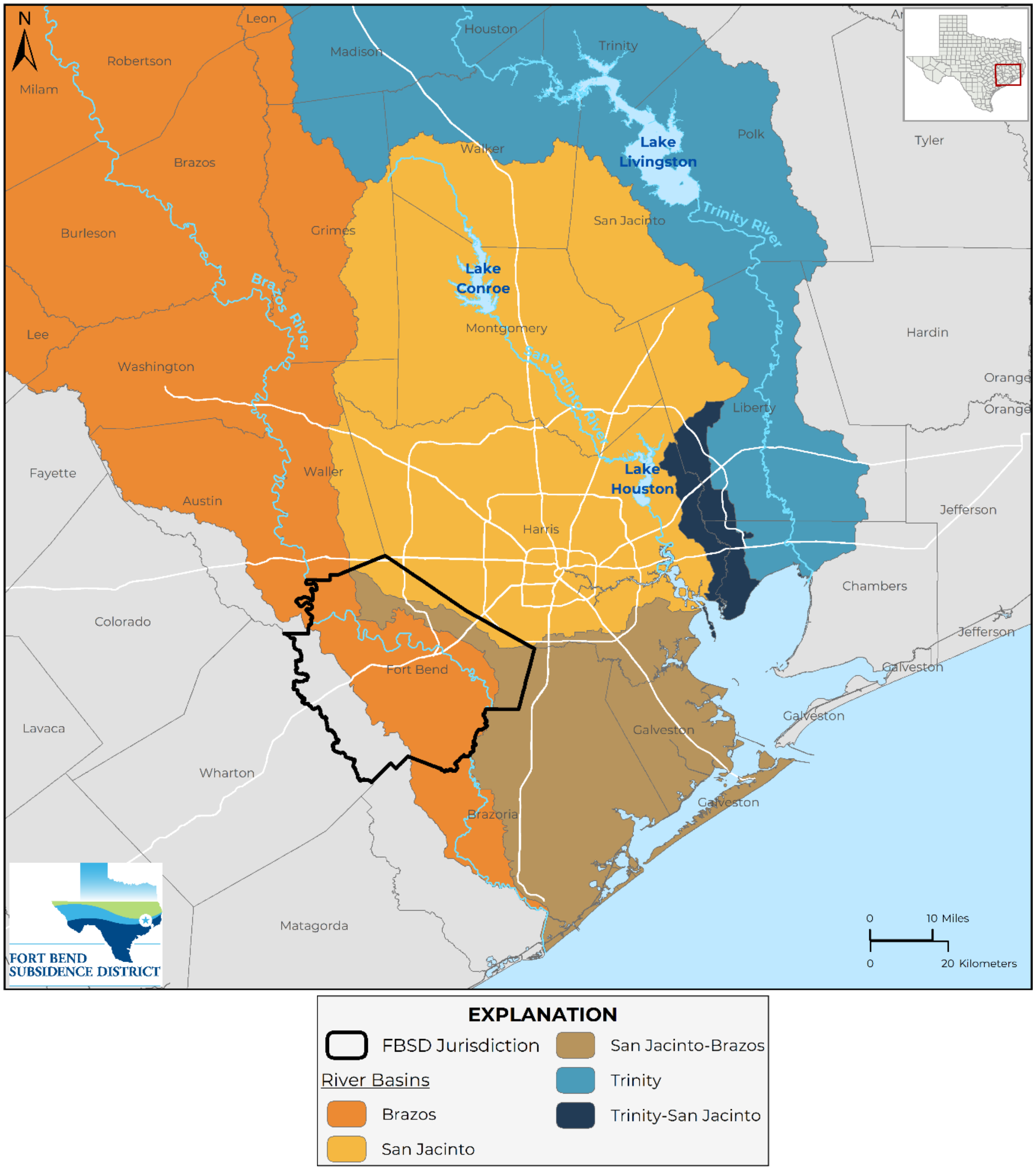


Figure 3: River basins that supply alternative water to Fort Bend and surrounding counties.

Alternative Source Waters

In the 1950s, the City of Houston along with other entities in the region began the development of several water supply reservoirs to provide water for the rapidly growing region within the Brazos, San Jacinto and Trinity River Basins. The water treatment plants served by these surface water sources are operated by the City of Houston, City of Sugar Land, City of Missouri City, City of Richmond, the Gulf Coast Water Authority, the Brazosport Water Authority, and others.

Two projects are currently underway to develop the necessary alternative water supply and distribution infrastructure to facilitate the District's future conversion requirements:

- Northeast Water Purification Plant Expansion will expand the existing surface water treatment plant located on Lake Houston by 320 MGD, in order to treat the raw surface water conveyed by the Luce Bayou Interbasin Transfer project.
- The Surface Water Supply Project will convey treated water from the expanded Northeast Water Purification Plant into western Harris County and northeastern Fort Bend County.

In addition to the two projects described above, the City of Houston and the Water Authorities are each designing and constructing their own distribution systems to convey the treated surface water to their customers. These interrelated regional projects are planned to be completed by 2025, just prior to when the next conversion requirements of the District go into effect in 2027. **Figure 4** shows the extent of these projects. Additionally, the Luce Bayou Interbasin Transfer is operational as of 2024 and pumps untreated surface water from the Trinity River through a series of canals and water pipelines along Luce Bayou to Lake Houston.

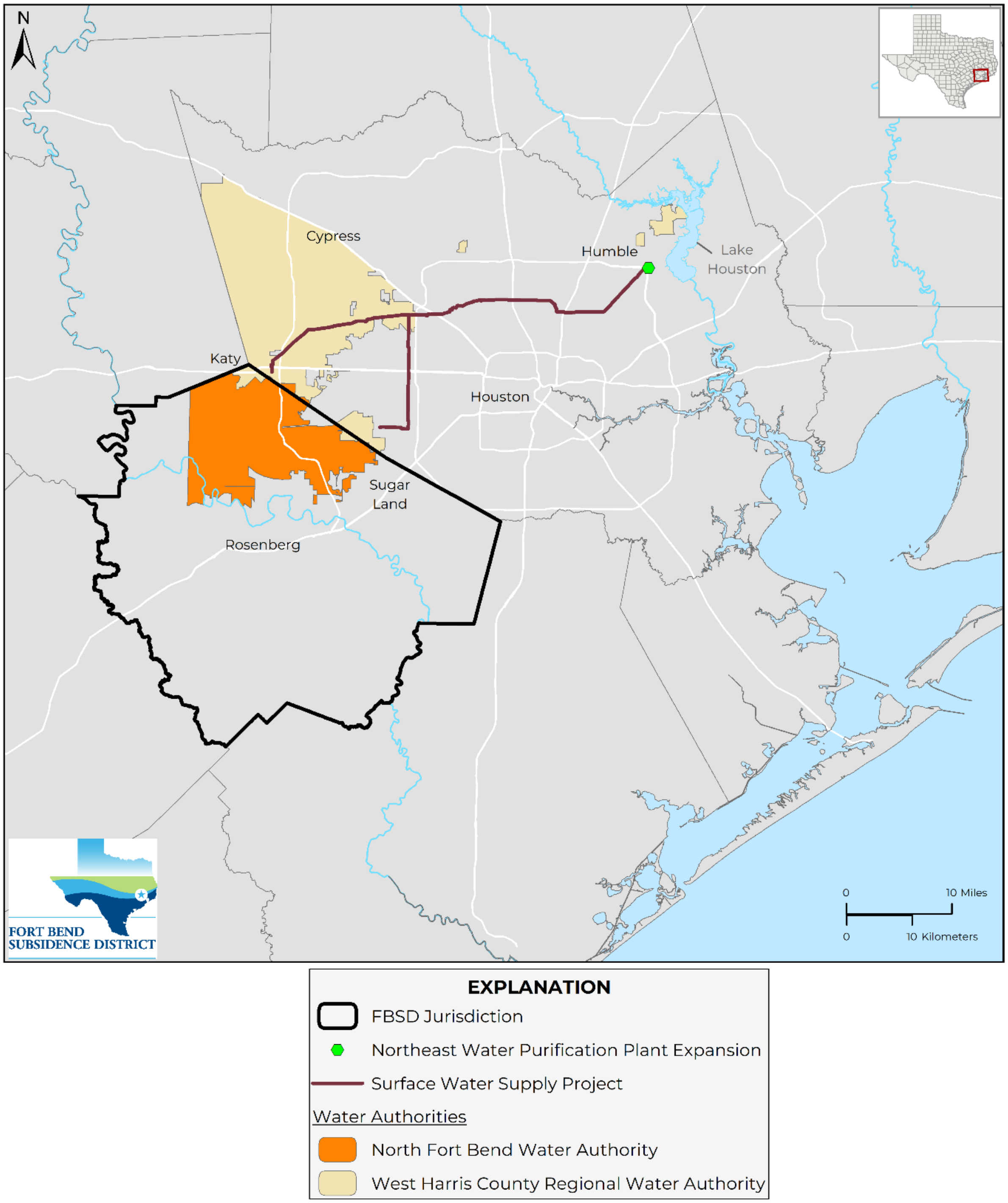


Figure 4: Alternative water supply and infrastructure distribution projects in Fort Bend County and the greater Houston region.

2023 Climate Summary

The District reviews local climatic data provided by the National Oceanic and Atmospheric Administration (NOAA) – National Weather Service (NWS) climate stations within and around the District (**Figure 5**). Variation in local precipitation, specifically deviation from historical normal, is important to the District because it has a direct impact on the magnitude of the total water demand of water users in the region and the availability of alternative water supplies. During periods of above normal precipitation in the region, total water demand remains typically near normal or below normal due to reduced municipal and agricultural water uses. Conversely, during periods of below normal precipitation, the total water demand of the region will typically increase due to increased water use. Additionally, during prolonged periods of below normal precipitation, natural limits on alternative supplies may require additional groundwater use – and subsequently result in additional lowering of groundwater aquifer levels, compaction of the aquifer materials, and subsidence observed at land surface. All stations ended 2023 with rainfall amounts below normal. (**Figure 5**).

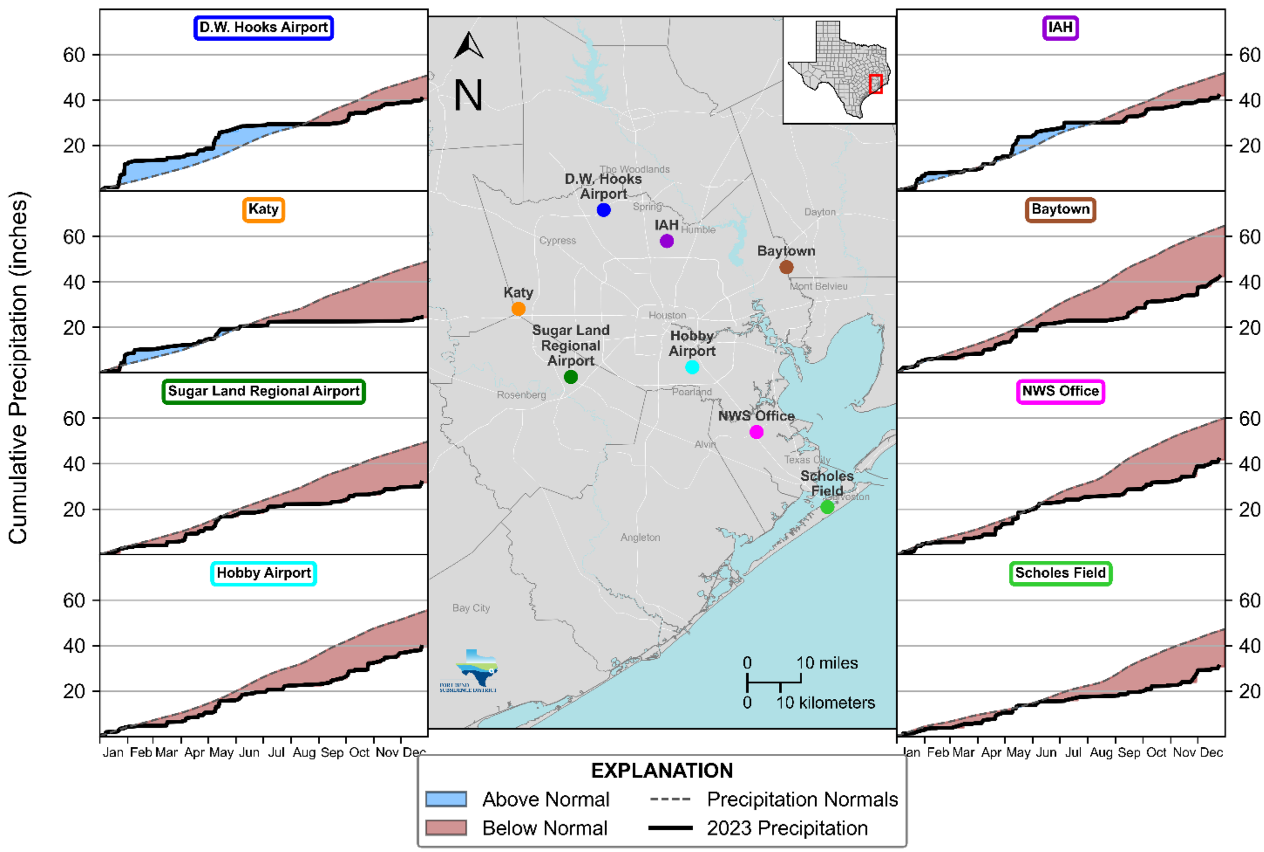


Figure 5. Location of National Oceanic and Atmospheric Administration (NOAA) National Weather Service (NWS) climate stations, in southeast Texas.

As shown in **Figure 6**, precipitation for the 2023 calendar year at the Sugar Land Regional Airport started below normal and remained below normal for the rest of the year. There were intermittent storms in the spring and fall that brought minor rainfall but it still wasn't enough to bring the cumulative rainfall above normal in 2023. Overall, all NWS climate stations recorded precipitation totals in 2023 at over 10 inches below normal.

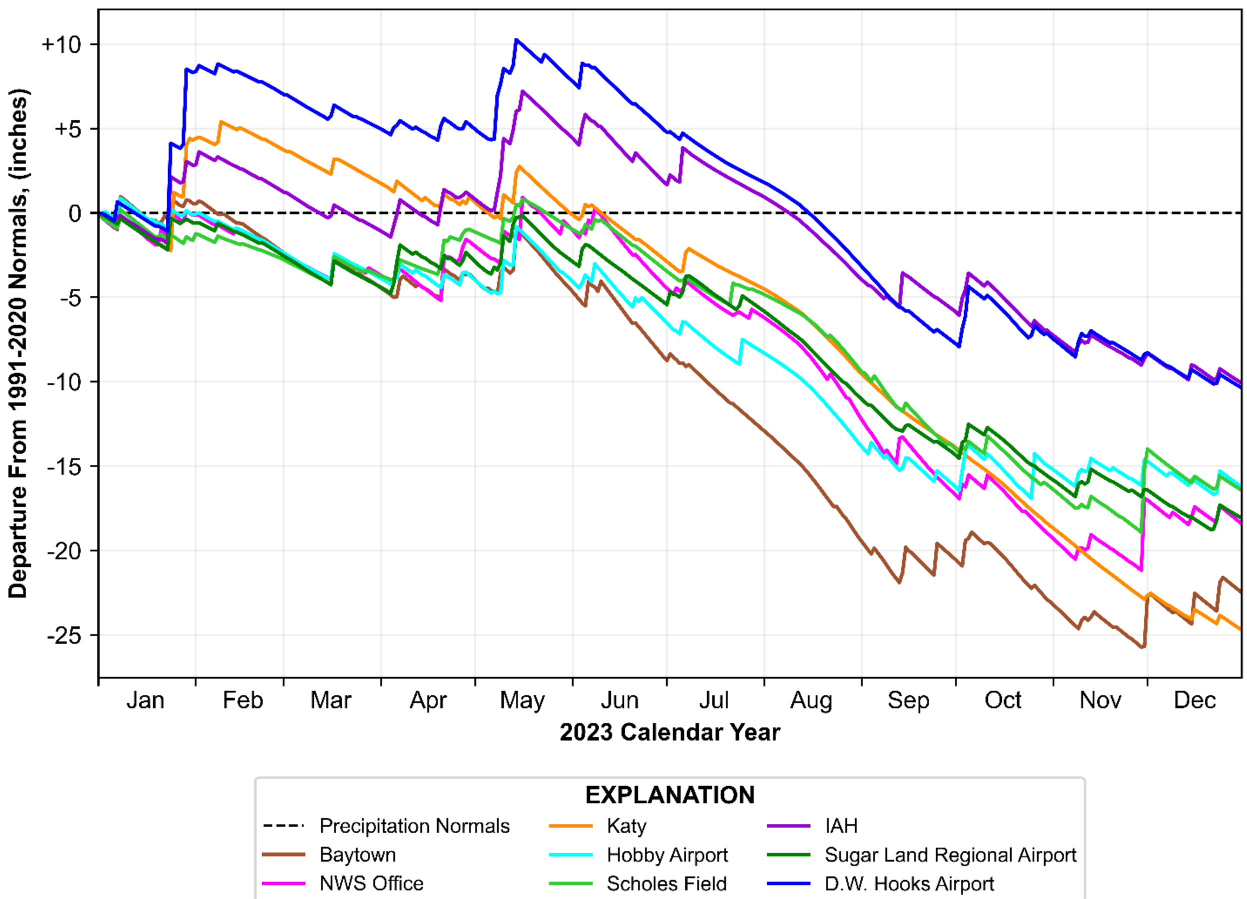


Figure 6. Cumulative precipitation, in inches, departure from 1991-2020 normal precipitation at selected NOAA-NWS Climate Stations within and around the District. Source: https://www.ncei.noaa.gov/access.

The largest cumulative rainfall recorded at the selected NWS climate stations was 42.2 inches at Baytown and is 22.5 inches below normal. Sugar Land Regional Airport cumulative rainfall recorded 31.62 inches, which was 18.1 inches below normal. The year ended with Katy having the greatest departure from normal at 24.7 inches below normal. In comparison, cumulative rainfall was 27.3 inches below normal during the 2011 drought.

2023 Water Use

The District collects groundwater and alternative water supply use annually from our permittees and other suppliers in the area. This information provides an understanding of how much groundwater is being used within the District, how our permittees are using groundwater and a perspective on the conversion from groundwater to surface water for the regulatory areas.

In 2023, there were a total of 1,824 permitted wells in the District. As of April 2024, a total of 1,520 of these permittees had submitted their annual water use data for the District to compile and use in this report. The groundwater withdrawals associated with these missing reports were estimated based on permitted allocations to be 2.7 MGD, which is under three percent of the reported withdrawals.

In addition to providing water use data for 2023, this report also provides updated groundwater withdrawal totals for the previously reported year of 2022. These changes are made during the normal permitting and reporting process as part of the exchange between the District and its permittees. The changes include updating estimated amounts with actual amounts, correction of data entry errors, and errors in the submitted data. There was an increase of 3.7 MGD, which is a four percent increase, from the previous 2022 reported value.

The following sections provide a summary of the information presented at the Public Hearing held on April 24, 2024. The exhibits used to provide testimony during the hearing are included in **Appendix A – Exhibits Presented at Public Hearing held on April 25, 2024**.

Overall Water Use

The four primary water uses in the District are public supply, industrial, agricultural, and other. The total amount of groundwater withdrawal for 2023 is 95.5 MGD, a three percent increase from 2022 (**Table 1**), with public supply being reported to be 82 percent of the overall use. Groundwater withdrawals had increased slightly since the District's inception in 1989 (**Figure 7**) with a 42 percent increase from 62.6 MGD in 1990 to 95.5 MGD in 2023. However, the 2023 pumpage was significantly higher compared to recent years most likely attributed to the extreme drought experienced in 2023 as well as the exceptional drought in 2022. Groundwater use hasn't been this high since before the reductions in 2013-2014 as required by the District's Regulatory Plan. Patterns in groundwater use have shifted over time, resulting in reduced groundwater use for industrial and agricultural needs compared with the 1990s and 2000s.

***Table 1**. Summary of Reported Groundwater Use (in MGD) by Regulatory Area.*

Water Use Category	Area A			Area B			Total		
	2022	2023	1-Year Change	2022	2023	1-Year Change	2022	2023	1-Year Change
Public	76.04	74.68	-2%	2.59	3.59	39%	78.63	78.27	0%
Industrial	2.75	4.07	48%	0.03	0.05	39%	2.78	4.12	48%
Agricultural	0.53	0.49	-6%	4.93	6.58	33%	5.45	7.07	30%
Other	5.00	5.52	10%	0.48	0.56	15%	5.49	6.07	11%
Total	**84.32**	**84.76**	**1%**	**8.04**	**10.77**	**34%**	**92.35**	**95.54**	**3%**

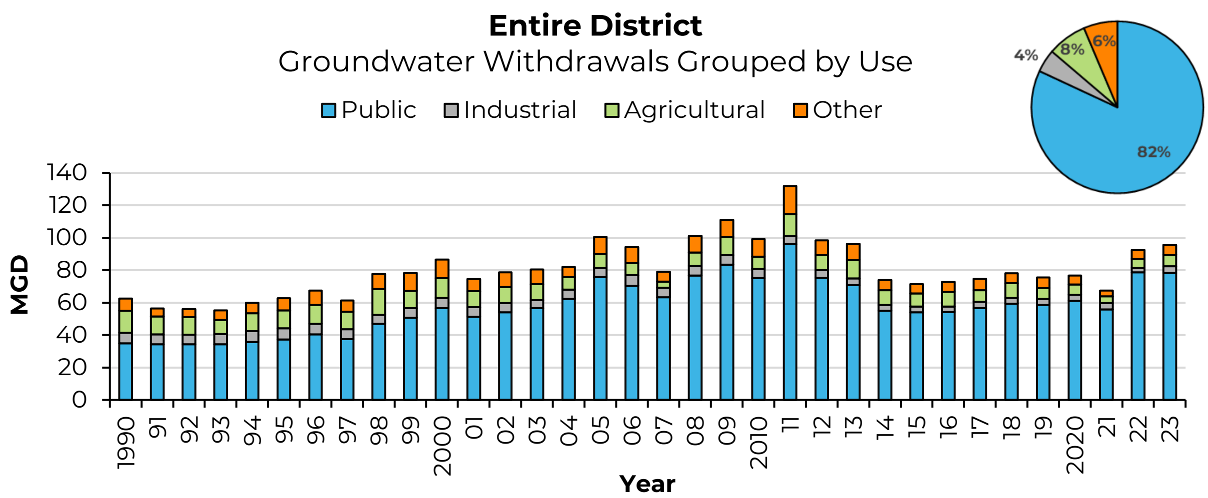


Figure 7: Groundwater withdrawals, in million gallons per day, by water use category from 1990 to 2023. The total groundwater used in the District was 95.5 MGD in 2023, with 82 percent of the use being public supply.

The District is divided into two regulatory areas that define how much groundwater may be utilized as a percentage of the total water demand (**Figure 2**). The groundwater withdrawals are grouped by regulatory area in **Figure 8**. This chart shows the impact of the District's Regulatory Plan, requiring conversion from groundwater to surface water over time and as a result the reduction in groundwater withdrawals in Regulatory Area A. Currently, wells located in Regulatory Area B have no restrictions on groundwater use.

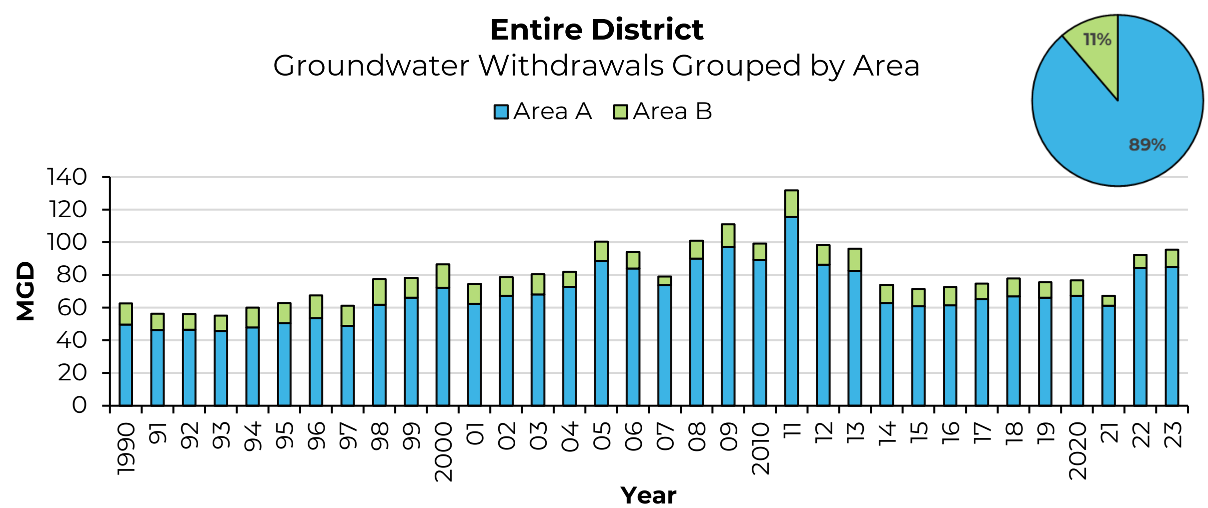


Figure 8: Groundwater withdrawals, in million gallons per day, by regulatory area from 1990 to 2023. In 2023, a total of 84.8 MGD of groundwater was used in Regulatory Area A, with 10.8 MGD used in Regulatory Area B.

Regulatory Area A

Regulatory Area A covers the northeastern portion of Fort Bend County. Cities and entities include Arcola, Cinco Ranch, Fulshear, Houston, Katy, Meadows Place, Missouri City, Pearland, Pleak, Richmond, Rosenberg, Sienna Plantation, Sugar Land, and Thompsons. This area began its conversion to alternate water sources back in 2011, when the North Fort Bend Water Authority began taking water from the City of Houston.

In 2023, total groundwater withdrawal in Regulatory Area A was 84.8 MGD, a three percent increase from the previous year (**Figure 9**). The majority of groundwater use in Regulatory Area A is associated with public supply use, which comprises over 88 percent of the use in the area. Industrial use is less than half of what it was in 1990. Irrigation use is typically correlated to climate and rainfall patterns. The amount of groundwater used for irrigation increased by ten percent in 2023 to 5.6 MGD, but about one-third less than the 15.5 MGD used during the 2011 drought.

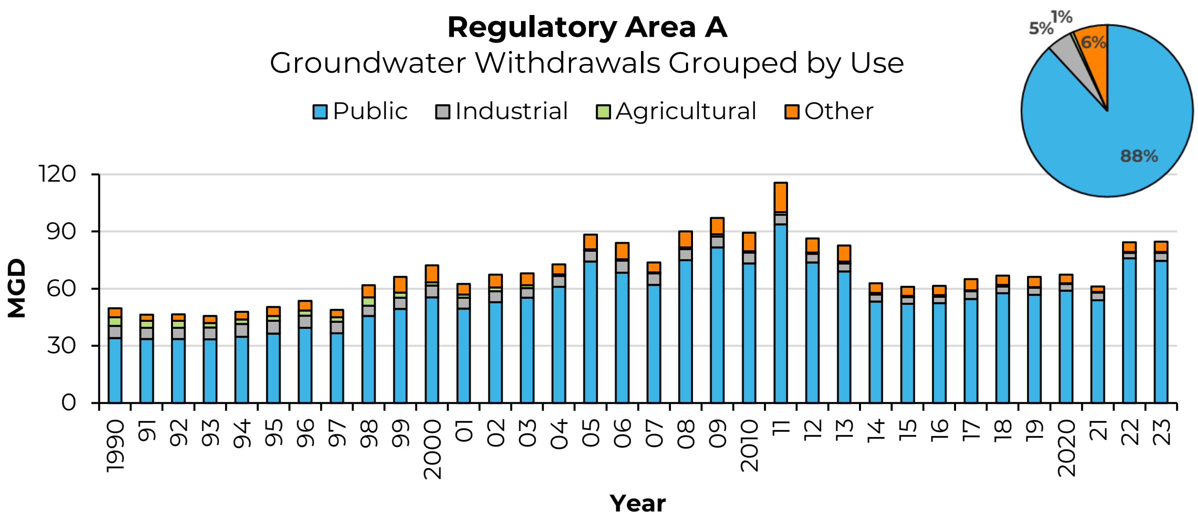


Figure 9: Groundwater withdrawals for Regulatory Area A, in million gallons per day, by water use category from 1990 to 2023. A total of 84.8 MGD of groundwater was used in Regulatory Area A in 2023, with 88% of the withdrawals being used for public supply.

Regulatory Area B

Regulatory Area B covers the western and southern areas of the District. Cities, villages and entities include Beasley, Fairchilds, Kendleton, Needville, Orchard, Simonton, and Weston Lakes.

Total groundwater withdrawal increased by 34 percent in Regulatory Area B from 8.0 MGD in 2022 to 10.8 MGD in 2023 (**Figure 10**). Public supply groundwater use increased by 39 percent over 2022 to 3.6 MGD. Industrial groundwater usage increased by 39 percent to 0.05 MGD and irrigation usage increased to 7.1 MGD, which represents a 32 percent increase in use from the previous year. Groundwater withdrawals have generally decreased in Regulatory Area B since the 2011 drought.

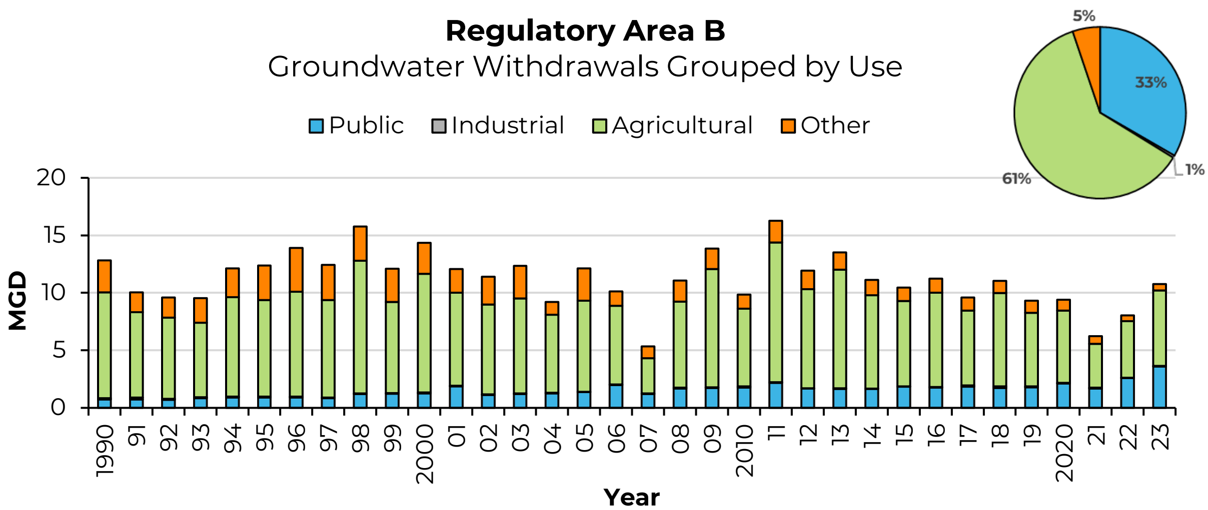


Figure 10: Groundwater withdrawals for Regulatory Area B, in million gallons per day, by water use category from 1990 to 2023. A total of 10.8 MGD of groundwater was used in Regulatory Area B in 2023, with 61% used for agricultural purposes.

Alternative Water Supply and Total Water Use

The District's Regulatory Plan requires permittees to convert to alternative water supplies in order to reduce their reliance on groundwater sources. The primary alternative water supply used in our region is surface water sourced from three river basins: the Brazos River Basin, the San Jacinto River Basin and the Trinity River Basin (**Figure 3**). Alternative water use from these basins are provided in **Table 2**. The San Jacinto and Trinity River totals have been lumped together because it is not possible to get the exact number by basin.

Groundwater remains the largest source of water supply within the District as a whole. The Brazos River, as it has been since 1990, is still the single largest source of alternative water used within the District. Reclaimed water is also used as an alternative water supply, but to a much smaller degree. In 2023, all alternative water supplies were less than what used in 2022.

Table 2*. Summary of Reported Alternative Water Supply Use and Total Water Use (in MGD)*

Source		2022	2023	1-Year Change
Alternative Supplies	Brazos River Basin	67.9	67.1	-1%
	San Jacinto/Trinity River Basin	20.5	18.7	-9%
	Reuse	7.3	6.8	-7%
	Alternative Supply Subtotal	95.6	92.6	-3%
Groundwater		92.4	95.5	3%
Total Water Use		**188.0**	**188.1**	**0%**

Use of the Brazos River Basin supply has increased by 61 percent from 41.6 MGD in 1990 to 67.1 MGD in 2023 (**Figure 11**). The total water use for the District was determined to be 188.1 MGD in 2023, which is less than one percent higher than the previous year.

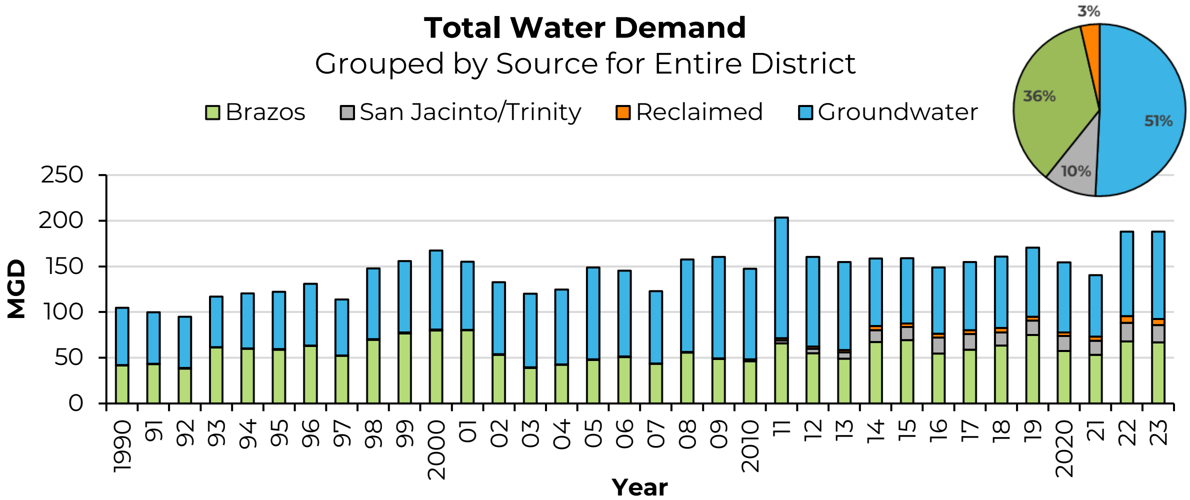


Figure 11: Total water use for the District, in million gallons per day, by source from 1990 to 2023. The total water use for the District in 2023 was 188.1 MGD. The 2023 total water demand ranks second in historical use with the 2011 drought being the first at 203.5 MGD.

2023 Groundwater Level Summary

All groundwater used in the District is sourced from the Gulf Coast Aquifer System, which is composed of three primary water-bearing units. Units most widely used in the District are the Chicot and Evangeline (undifferentiated) aquifers. The Chicot aquifer is the shallowest aquifer in the District which is hydrologically connected to the Evangeline aquifer immediately below. The Burkeville confining unit lies beneath the Chicot/ Evangeline (undifferentiated) aquifer and isolates the third primary aquifer, the Jasper aquifer. The Jasper aquifer is not widely used in the District but is a primary source of water for other counties.

Annually, since 1990, the USGS has measured the water level in hundreds of wells throughout the Houston Region in cooperation with the Fort Bend Subsidence District through a joint funding agreement along with additional cities, HGSD and groundwater conservation districts to monitor and provide reports on groundwater level altitude data for the primary aquifers. Since aquifer water-level is the best measure of the pressure in the aquifer, this information is important to understand the impact of changes in water use on subsidence.

The 2023 potentiometric surface (i.e., the interpolated surface created from water-level data) from the Chicot/ Evangeline (undifferentiated) aquifer show the areas of primary stress on the aquifer occurs in northeastern Fort Bend County (**Figure 12**). Generally, Regulatory Area A has seen a large decline in the water-level of almost 250 feet below datum in the Chicot/Evangeline (undifferentiated) aquifer in the Katy/Cinco Ranch area (**Figure 12**). This area is growing rapidly and the conversion to alternative water will not be completed in the District until 2027.

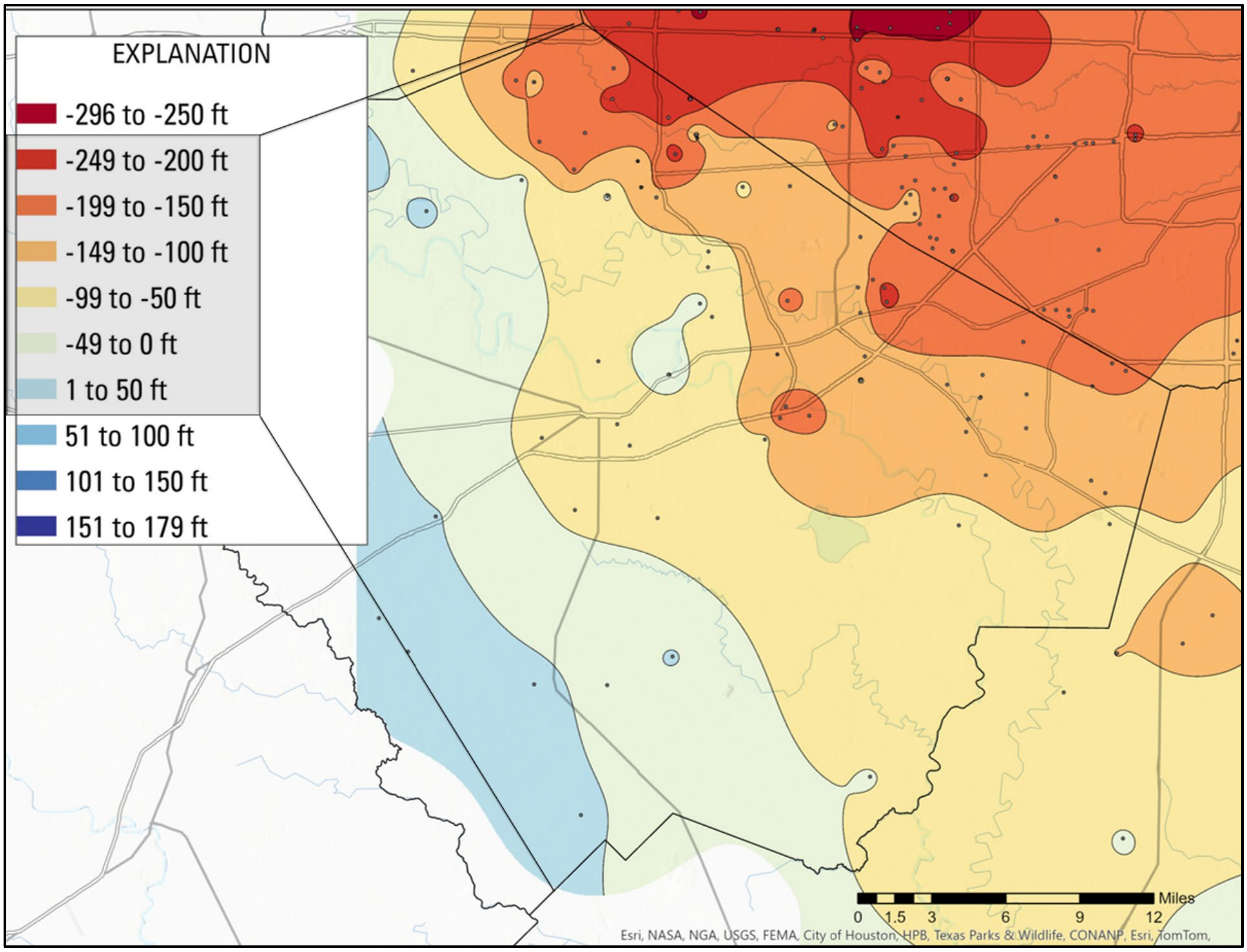


Figure 12: Altitude of the potentiometric surface determined from water-levels measured in tightly cased wells screened in the Chicot/Evangeline (undifferentiated) aquifer, Fort Bend County, Texas, 2024 (Source: USGS provisional data – preliminary and subject to change).

The change in water-levels from 2013 to 2024, as shown in **Figure 13**, include areas of rise within Regulatory Area A such as Sugar Land and Missouri City with over 20 feet in the Chicot/Evangeline (undifferentiated) aquifer as these areas began utilizing alternative water in compliance with the District's Regulatory Plan.

The information presented in this section is a summary of the provisional data presented at the Public Hearing held on April 25, 2024. The exhibits used to provide testimony during the hearing as well as supplemental data not shown are included in **Appendix A – Exhibits Presented at Public Hearing held on April 25, 2024**. A USGS Scientific Investigation Report will be released later this year documenting the status of groundwater level altitudes and the long-term changes in the aquifers.

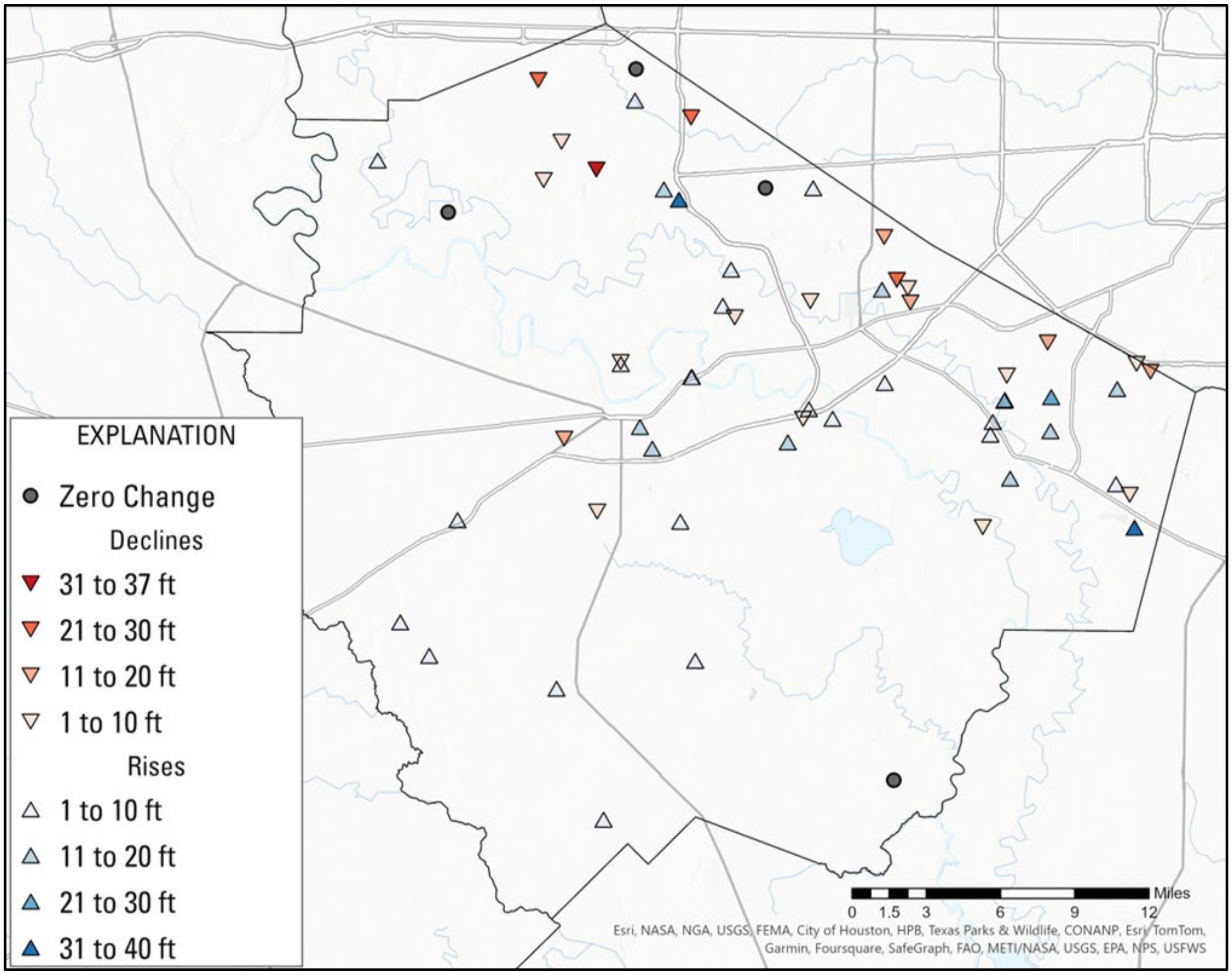


Figure 13: Water-level change at wells screened in the Chicot/Evangeline (undifferentiated) aquifer, Fort Bend County, Texas, from 2013 to 2024 (Source: USGS provisional data – preliminary and subject to change).

2023 Subsidence Trend Analysis

Subsidence is the lowering of land surface elevation. In the greater Fort Bend County area, subsidence occurs from the compaction of clays due to groundwater withdrawal. As the water-level of the aquifer declines, fine-grained sediments, such as silt and clay, in the aquifer depressurize and compact. This compaction results in the lowering of overlying stratigraphic units and is observed at the surface as subsidence.

Global positioning system (GPS) stations have been installed across southeast Texas in order to track subsidence since the 1990s. This GPS network consists of a collaboration between the District, HGSD, UH, TxDOT, BCGCD, and other agencies. The GPS network has grown to over 190 active stations throughout the region as of 2023 (**Figure 14**).

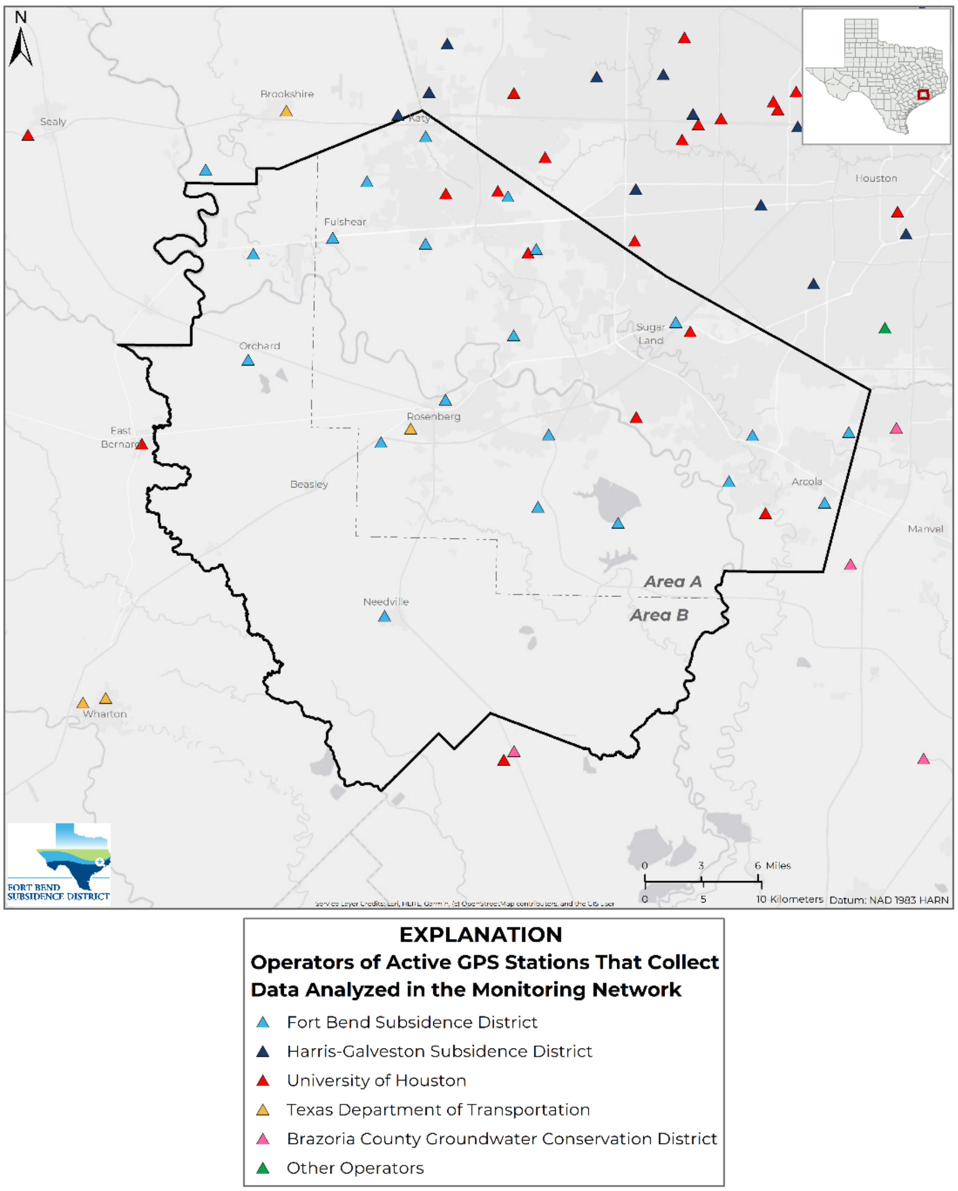


Figure 14. GPS network designated by operator for stations that were actively collecting data in 2023 and were used in the calculation of subsidence rates in Fort Bend and adjacent counties.

The District collects raw GPS data from the active stations in the network and collaborates with Dr. Guoquan Wang at UH for processing. Aspects of GPS processing include upload to archives, data conversions, transformations to a stable reference frame designated as Houston20 to remove natural movements such as plate tectonics (Agudelo, et al., 2020) and identification and removal of outliers (Wang, et al., 2022). The District uses these GPS data to evaluate long-term subsidence trends at each location over the entire period of record and to determine the average annual subsidence at each location over the most recent 5-year period.

This analysis allows the District to determine the impact of the District Regulatory Plan on the occurrence and magnitude of subsidence as well as identify impacts of management strategies (or lack thereof) in adjacent counties on subsidence within the District. Additional information on the average annual subsidence rate and period of record data for each GPS station are provided in **Appendix B – Period of Record Data**.

Period of Record Data

The period of record includes GPS measurements of the ellipsoidal height that are collected over the lifespan of each GPS station. It is used to track the full history of land-surface deformation and is represented as a vertical displacement time series. The vertical displacement is determined by the change in ellipsoidal height, which is the distance from a point on the earth's surface to the reference ellipsoid. The reference ellipsoid is a mathematical representation of the earth's surface as a smoothed ellipsoid. Although the ellipsoid height is not the same as elevation, or the orthometric height, research has shown that linear trends of vertical displacement at GPS stations over the same time interval were the same for both ellipsoidal and orthometric heights (Wang & Soler, 2014). Therefore, ellipsoidal heights are used to estimate vertical displacement of the land surface. Period of record plots give a historical context to understand local to regional subsidence trends and are provided in **Appendix B**.

Average Annual Subsidence Rate

The average annual subsidence rate is a useful measure to show the recent change in land surface deformation at each GPS station. The subsidence rate, presented in this report, is determined by using linear regression (i.e., the statistically determined best fit straight line through a scatter plot of data points) of the last five years of data for GPS stations with at least three years of monitoring and were actively monitoring in 2023. **Figure 15** depicts the average annual subsidence rate from 2019 to 2023 over 20 GPS stations located in Fort Bend County as well as additional GPS stations in the subsidence monitoring network.

Regulatory Area A has the highest subsidence rates (greater than 2.0 centimeters per year) in the northeastern area of Fort Bend County near the county border between Waller and Harris counties as well as the eastern portion of the county near the border to Brazoria County. The southern areas of Regulatory Area A and all of Regulatory Area B show very minor subsidence with subsidence rates below half a centimeter per year.

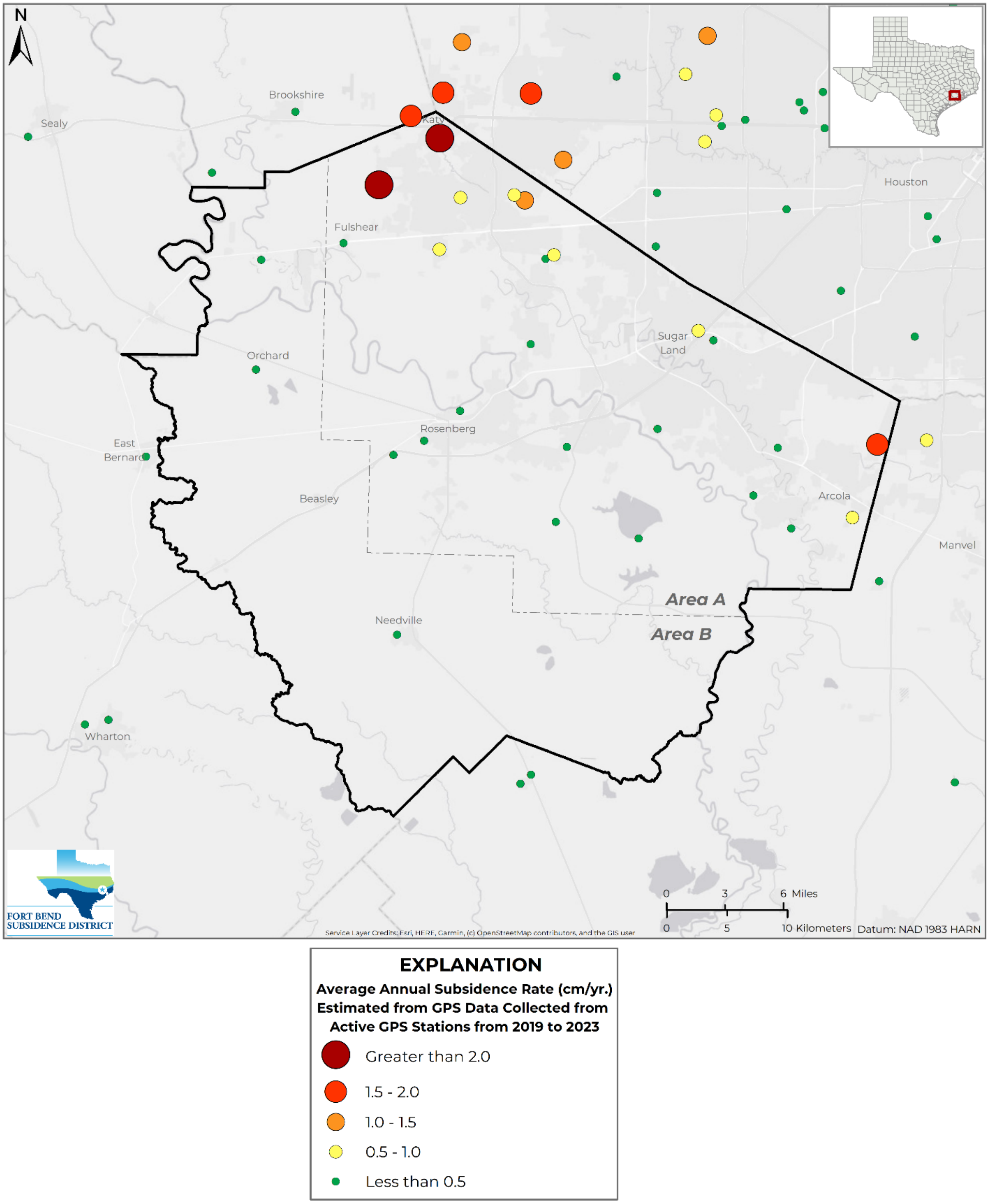


Figure 15: Annual subsidence rate, measured in centimeters per year, referenced to Houston20 and estimated from three or more years of GPS data collected from active GPS stations in Fort Bend and surrounding counties, Texas, averaged from 2019 to 2023.

Regulatory Area A contains GPS station P004, located in Sugar Land, that has measured a cumulative subsidence of 31.3 cm since monitoring began in 1994. **Figure 16** includes the POR plot and five-year rate for P004 that shows a declining trend from 1994 to 2001 then plateauing for the majority of the 2000s with only more recent declines beginning in 2022.

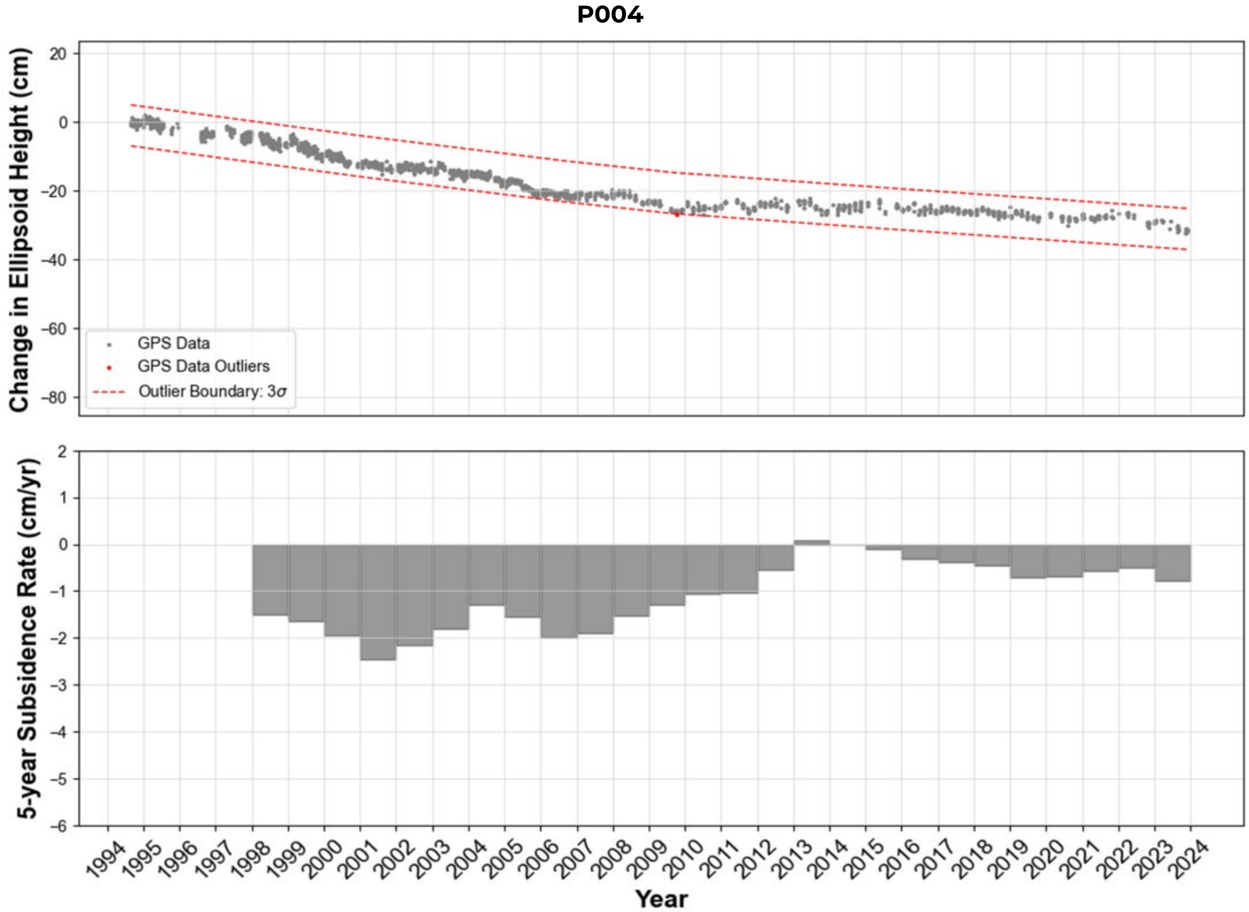


Figure 16: Period of record plot for P004 located in Sugar Land, Texas, 1994 to 2023. This station measured 31.3 cm of subsidence over 29 years and the 2019-2023 annual subsidence rate is 0.77 cm per year. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

References

Agudelo, G. et al., 2020. *GPS Geodetic Infrastructure for Subsidence and Fault Monitoring in Houston, Texas, USA.* s.l.:Tenth International Symposium on Land Subsidence.

Gabrysch, R., 1982. *Ground-Water Withdrawals and Land-Surface Subsidence in the Houston-Galveston Region, Texas, 1906-80,* s.l.: U.S. Geological Survey.

Ramage, J. K., Braun, C. L. & Ellis, J. H., 2022. *Treatment of the Chicot and Evangeline aquifers as a single hydrogeologic unit and use of geostatistical interpolation methods to develop gridded surfaces of water-level altitudes and water-level changes in the Chicot and Evangeline aquifers (undifferenti,* s.l.: U.S. Geological Survey Scientific Investigations Report 2022–5064, 51 p..

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[Accessed 04 03 2024].

Wang, G., Greuter, A., Petersen, C. M. & Turco, M. J., 2022. Houston GNSS Network for Subsidence and Faulting Monitoring: Data Analysis Methods and Products. *Journal of Surveying Engineering,* 148(4).

Wang, G. & Soler, T., 2014. Measuring land subsidence using GPS: Ellipsoid height versus orthometric height. *Journal of Surveying Engineering,* 141(2).

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Appendix A – Exhibits Presented at Public Hearing held on April 25, 2024

2023 Annual Groundwater Report

Public Hearing
April 25, 2024

FORT BEND
SUBSIDENCE DISTRICT

Fort Bend Subsidence District

The Fort Bend Subsidence District (FBSD) is a special-purpose district created by the Texas Legislature in 1989 to prevent further land subsidence in Fort Bend County.

GROUNDWATER REGULATION

Collaborate with local to state water entities and providers to manage groundwater use through water planning and well permitting.

RESEARCH & MONITORING

Utilize the highest quality data to monitor groundwater usage, aquifer characteristics, and land surface changes.

WATER CONSERVATION

Provide permittees, businesses, and educators with water conservation tools to reduce water use and empower the community to value water.

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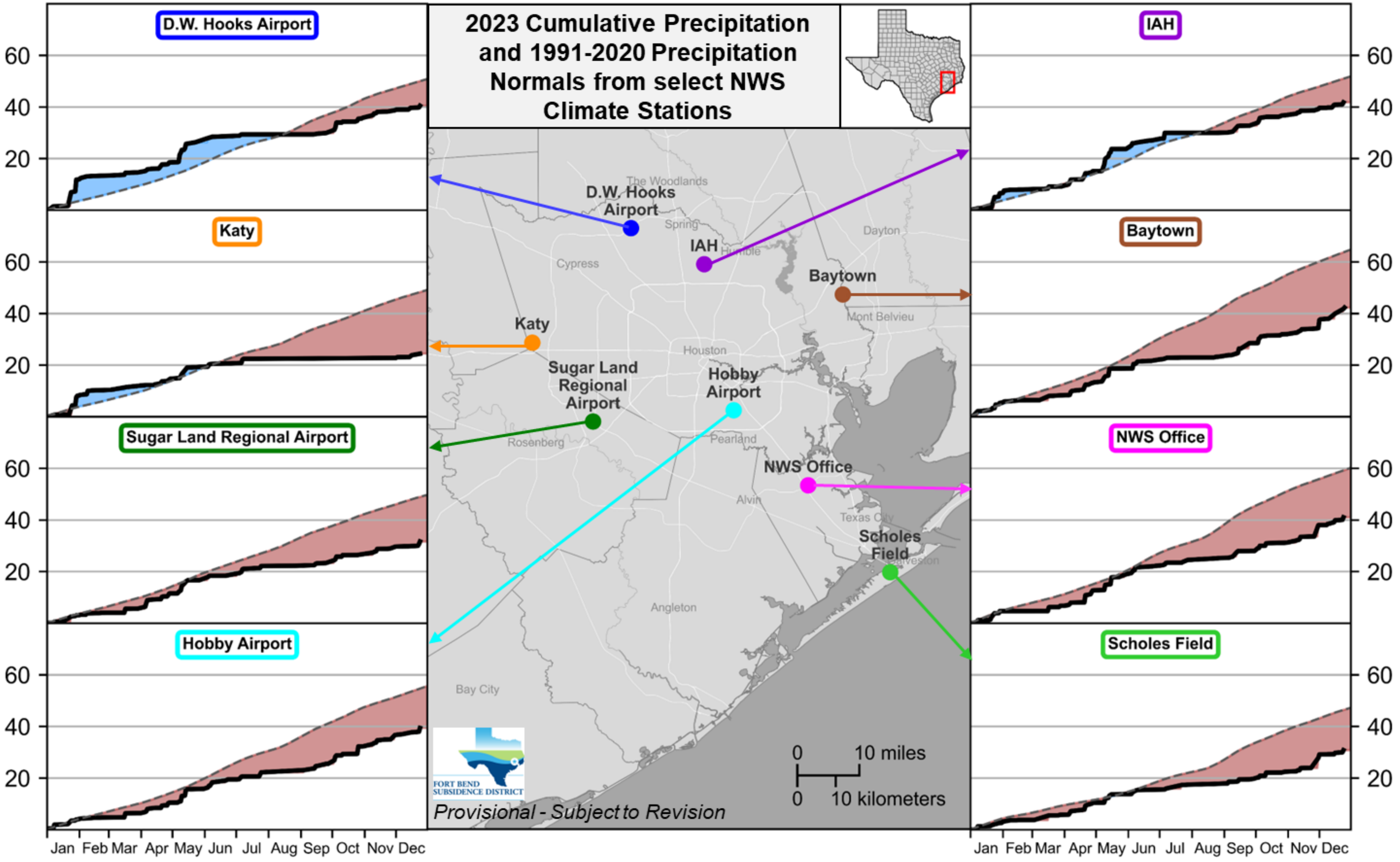
Exhibit 1

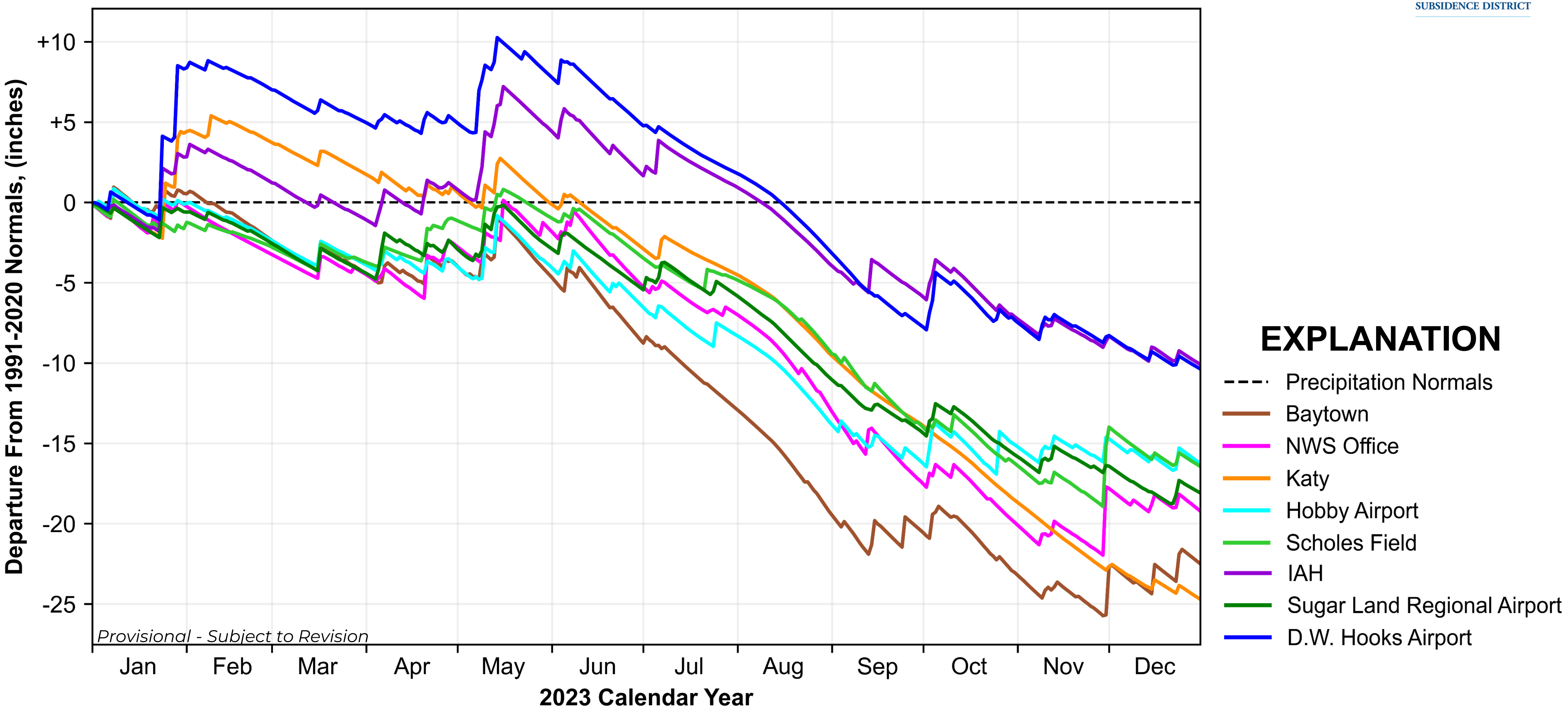
Location of National Weather Service (NWS) climate stations used for rainfall data for the 2023 calendar year.



EXPLANATION

Above Normal
Below Normal
Precipitation Normals
2023 Precipitation

Exhibit 2 2023 Precipitation Data



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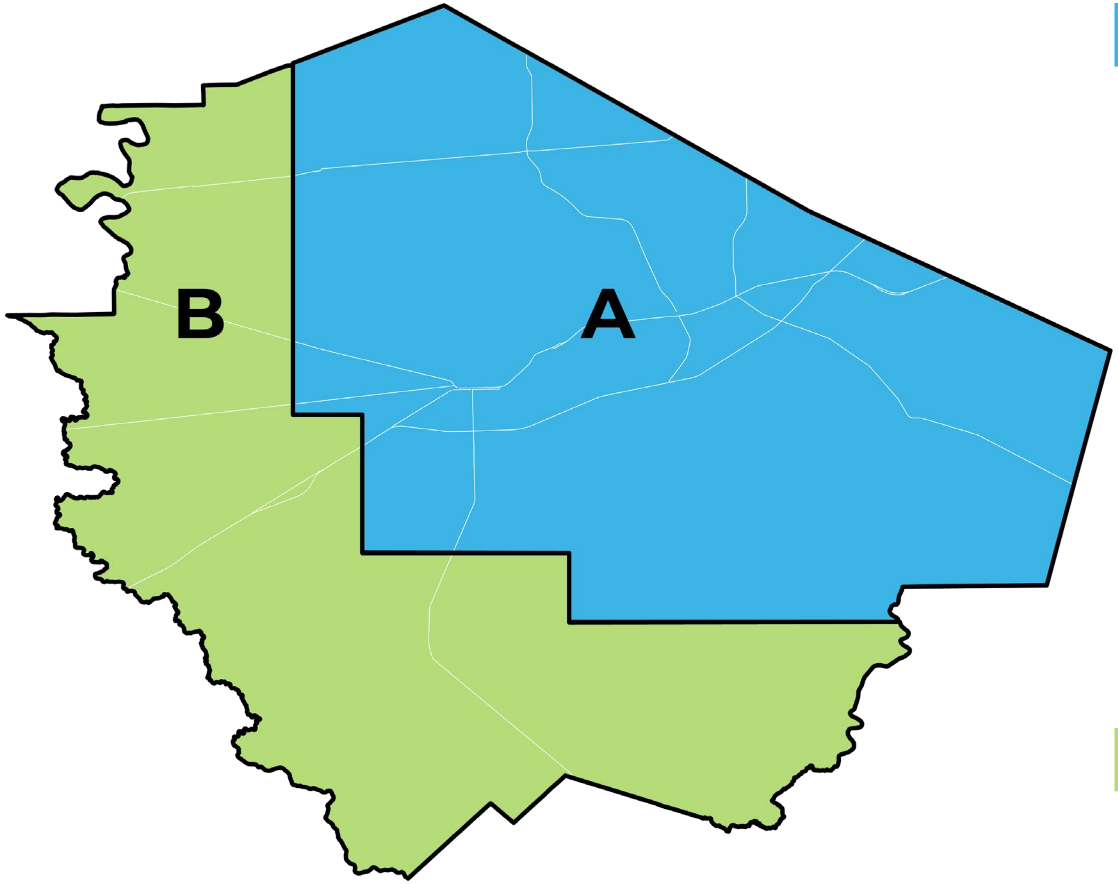
FBSD Regulatory Areas

FORT BEND SUBSIDENCE DISTRICT

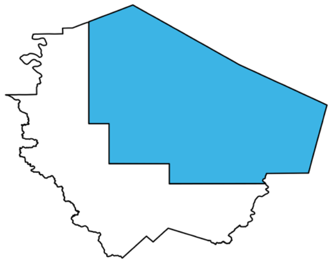


Area A: no more than 40% of Total Water Demand (TWD) may be sourced from groundwater.

- Permittees operating within an approved Groundwater Reduction Plan have the following requirements:
  - 2013 – no more than 70% of TWD from groundwater
  - 2027 – no more than 40% of TWD from groundwater

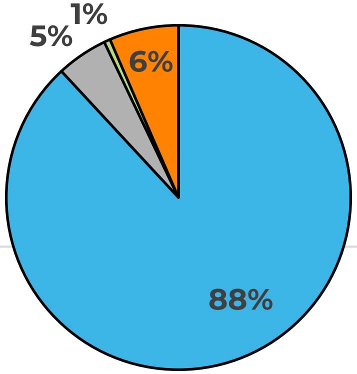
Area B: not subject to groundwater reduction requirements.

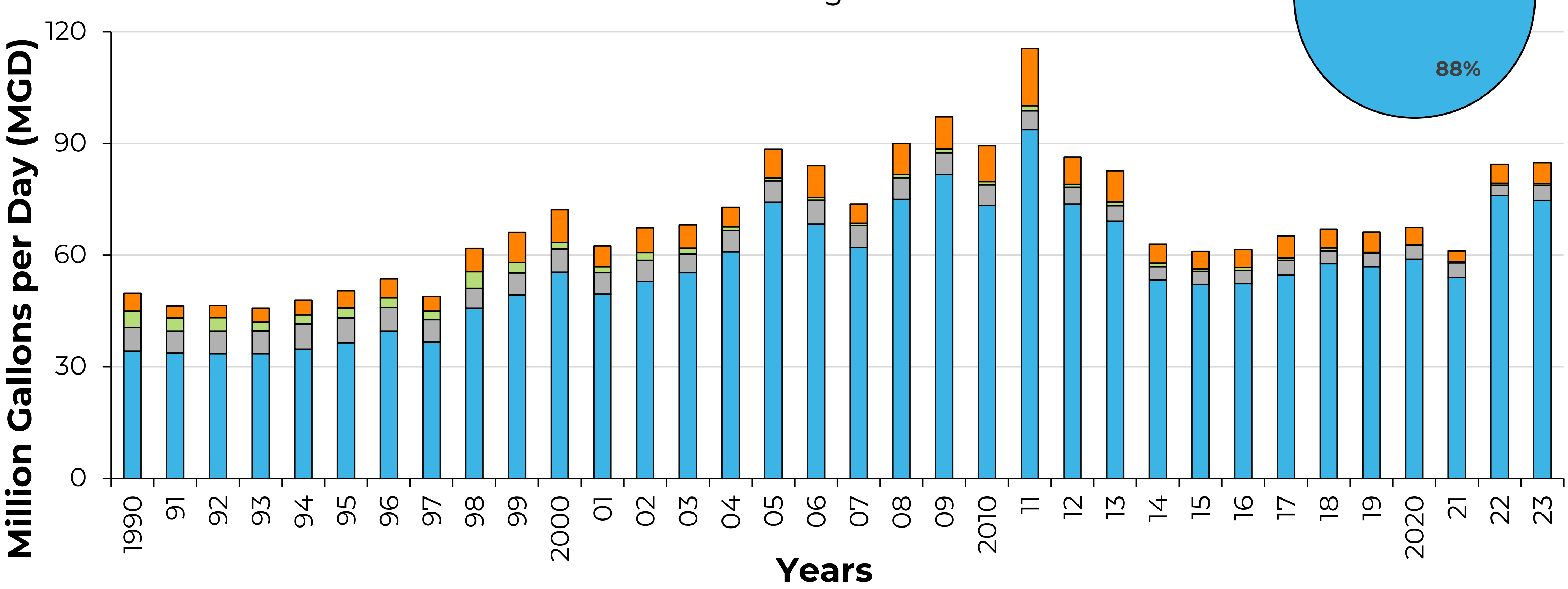
Exhibit 3 Regulatory Area A



FORT BEND SUBSIDENCE DISTRICT

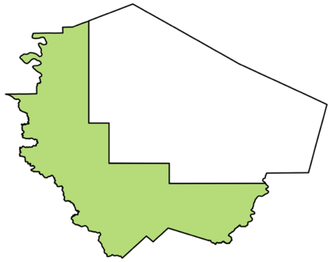
2023: 84.8 MGD

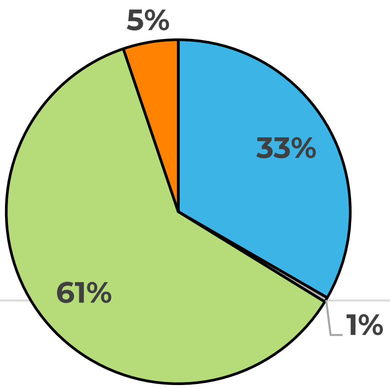


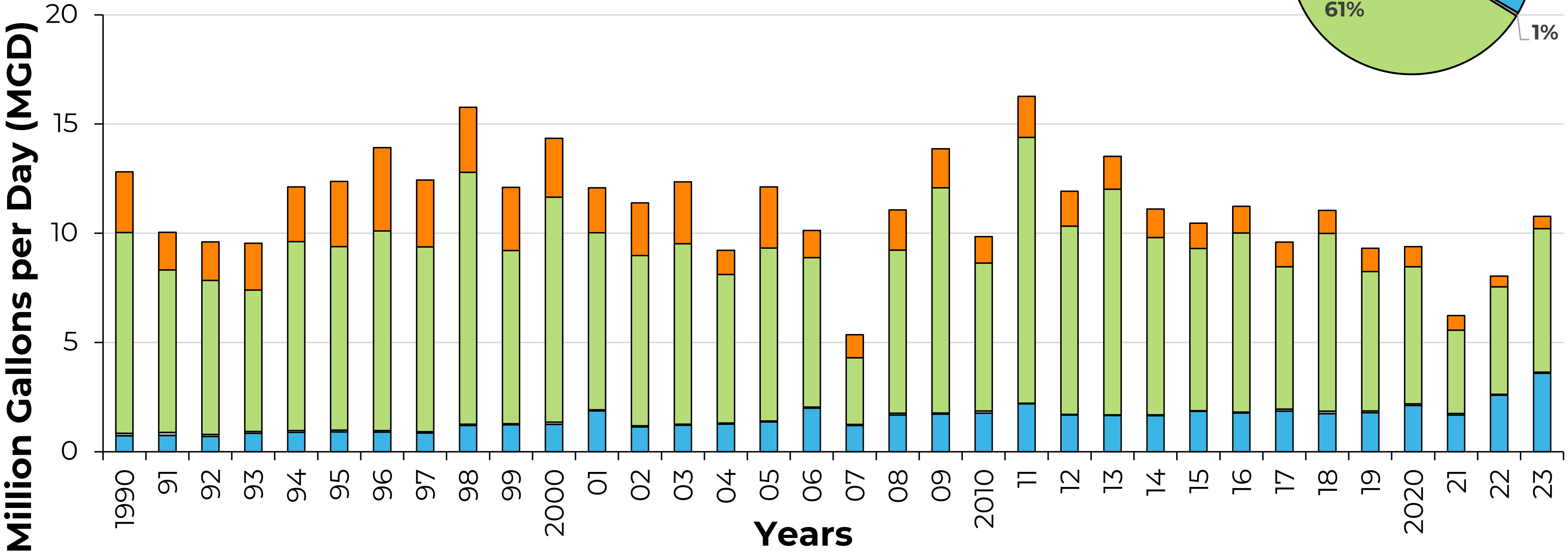


Provisional – Subject to Revision

Exhibit 4 Regulatory Area B





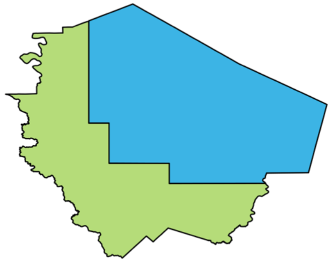


Provisional – Subject to Revision

Exhibit 5 Entire District

FORT BEND SUBSIDENCE DISTRICT

2023: 95.5 MGD



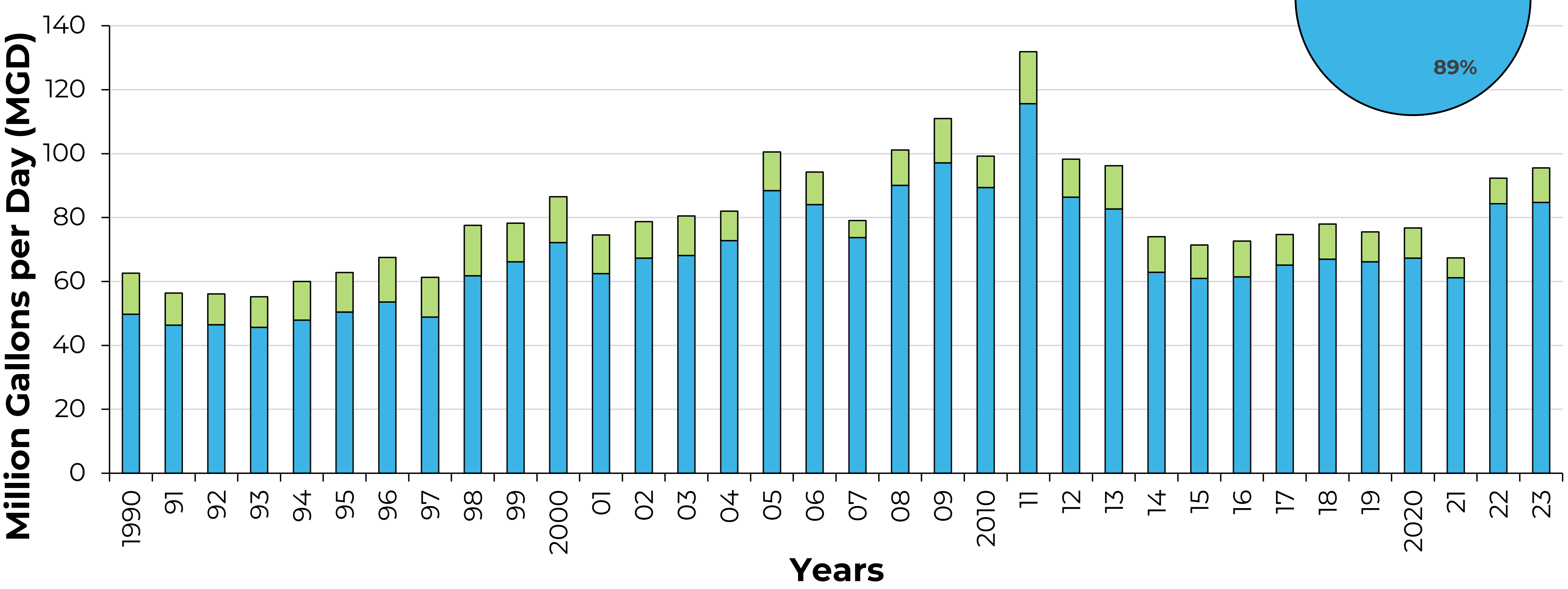


Exhibit 6 Entire District

2023: 95.5 MGD

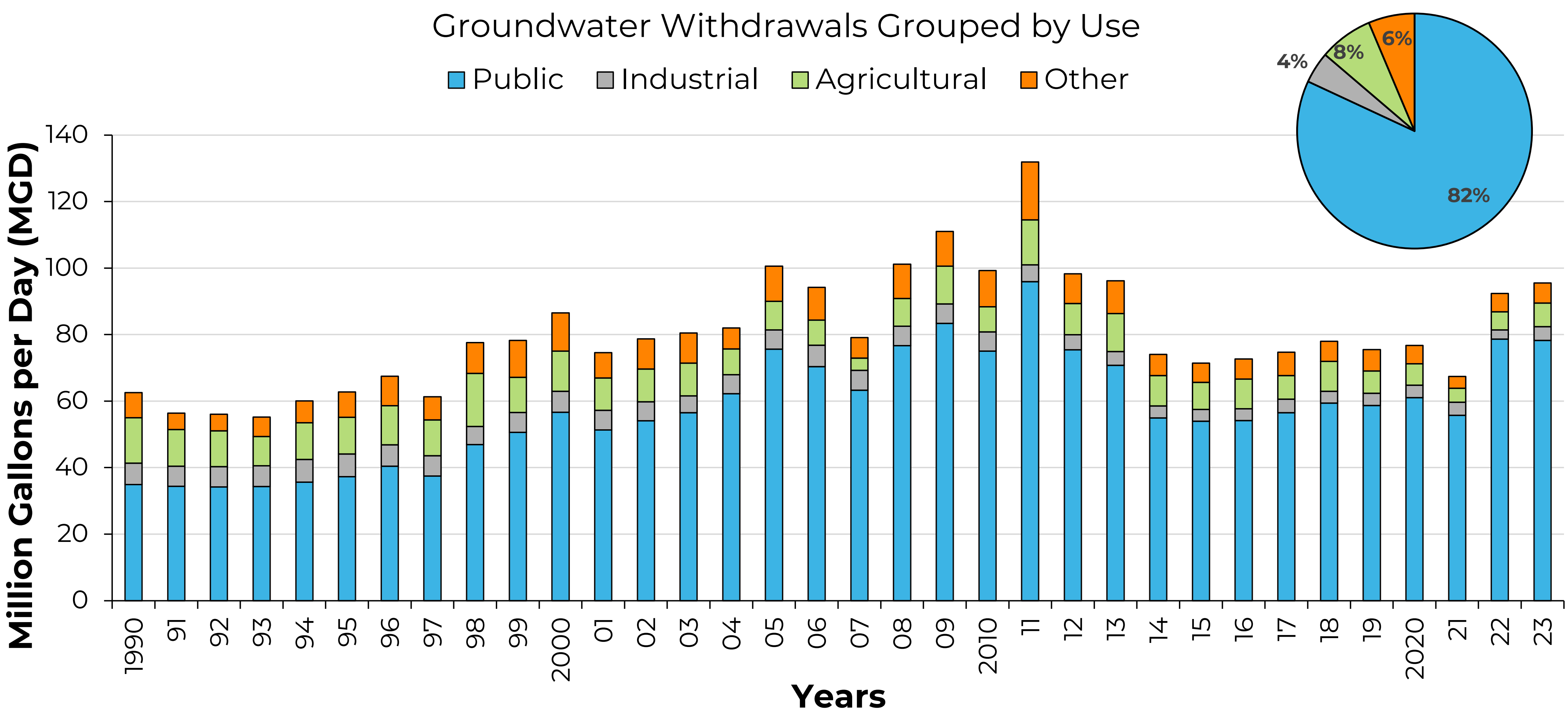


Exhibit 7 Alternative Water Use

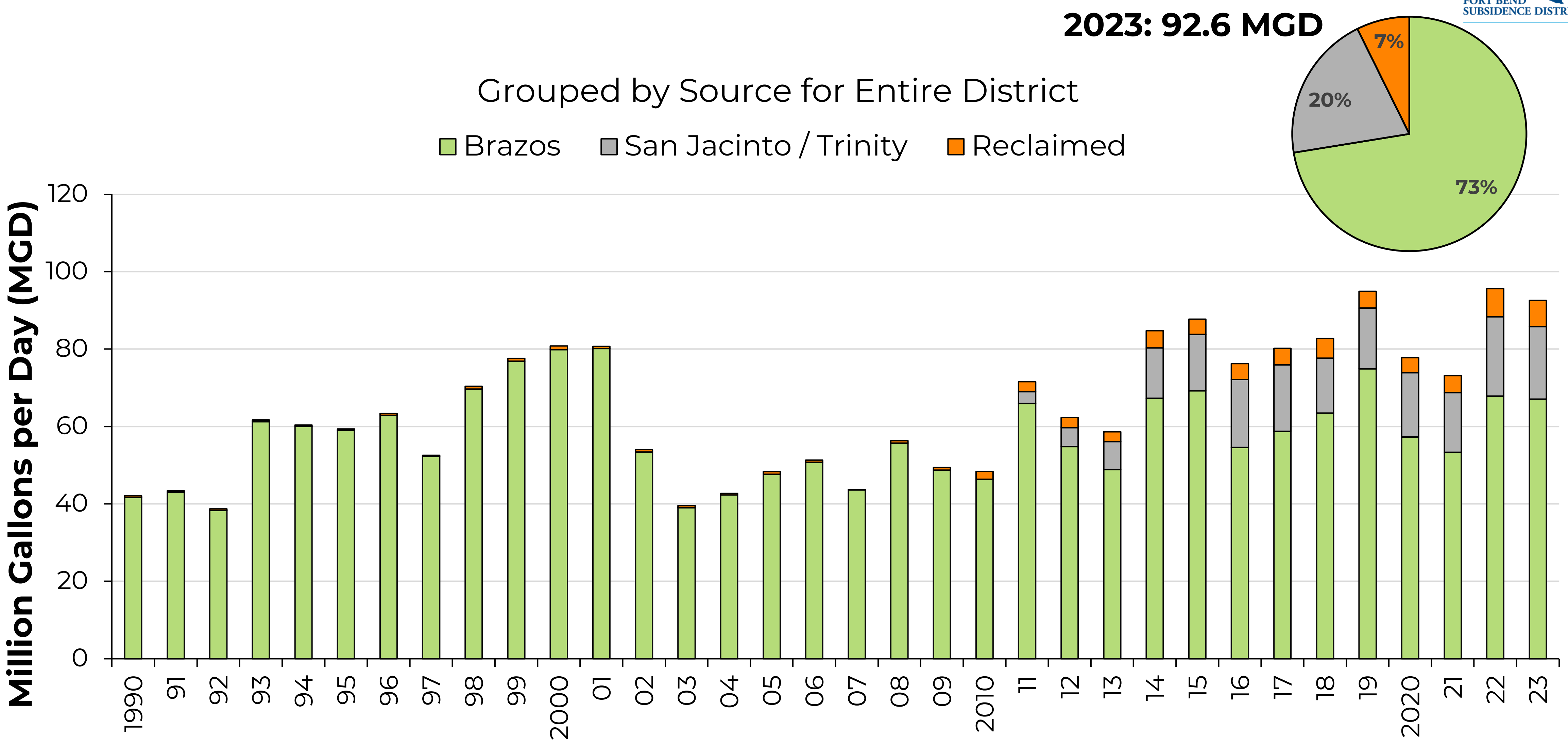
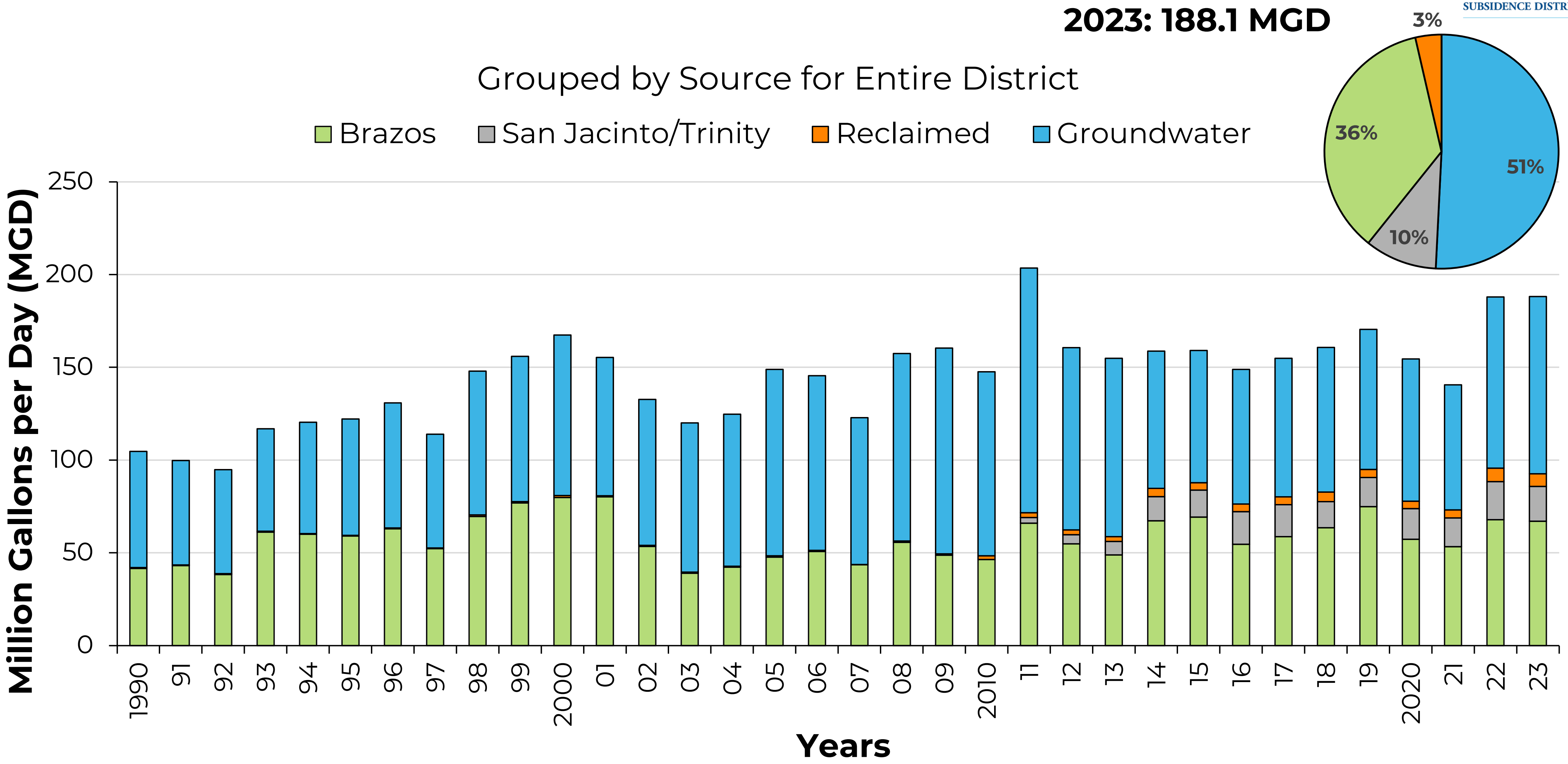


Exhibit 8 Total Water Demand



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USGS
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LONE STAR Groundwater Conservation District

BRAZORIA COUNTY GROUNDWATER CONSERVATION DISTRICT TEXAS

CITY OF HOUSTON TEXAS

HARRIS-GALVESTON SUBSIDENCE DISTRICT

FORT BEND SUBSIDENCE DISTRICT

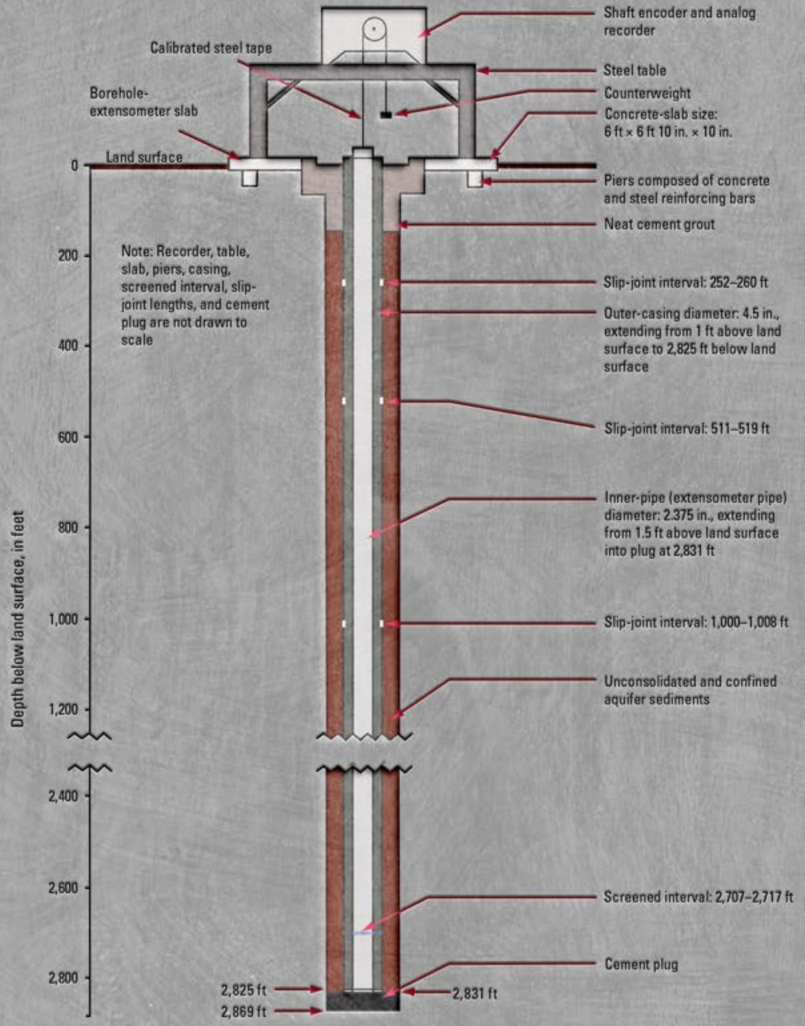


Diagram of a Borehole extensometer

Groundwater-level Altitudes, Long-Term Change & Compaction

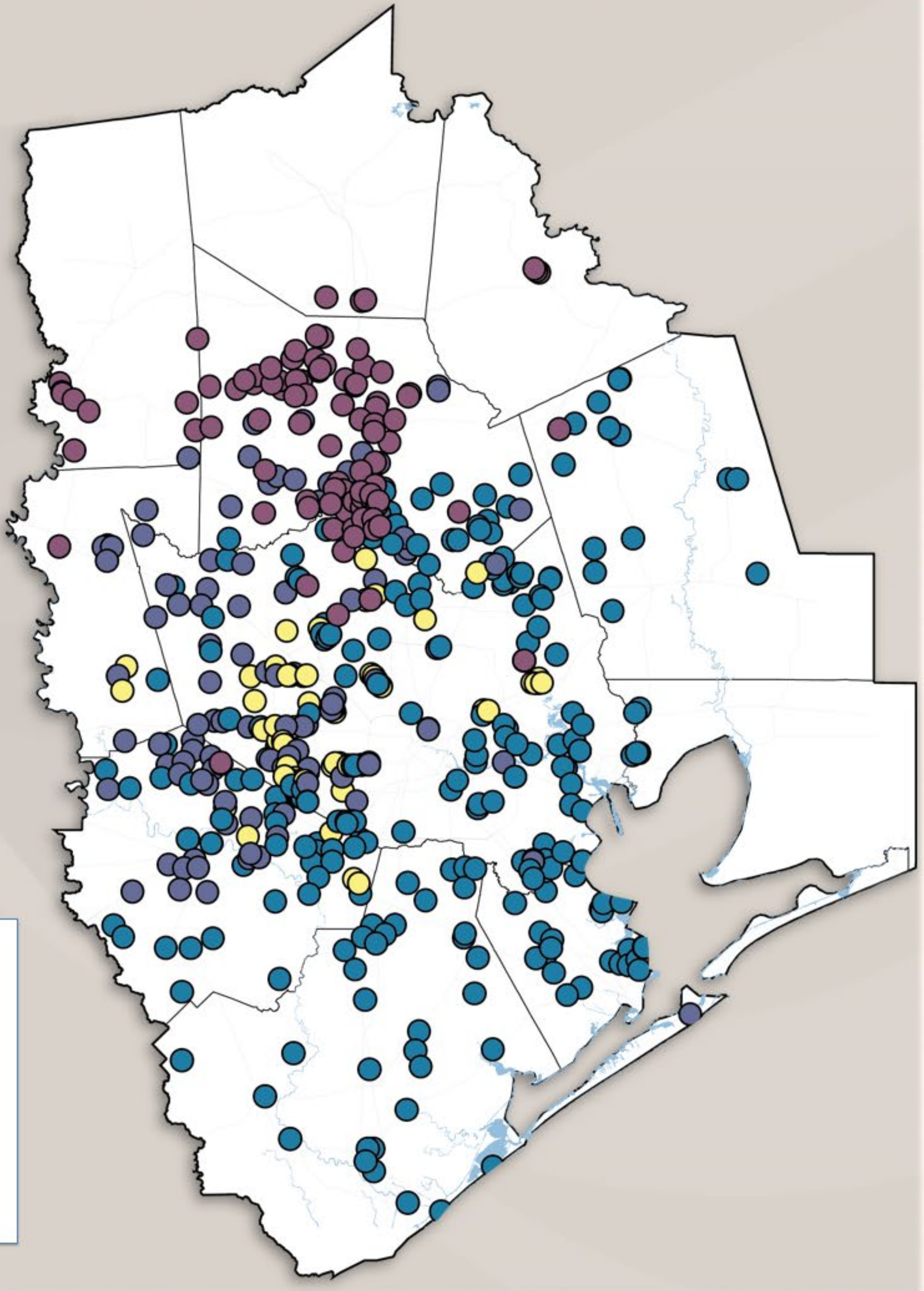
Chicot/Evangeline and Jasper Aquifers

Research in cooperation with the Harris–Galveston & Fort Bend Subsidence Districts Brazoria Groundwater Conservation District, The City of Houston and Lone Star Groundwater Conservation District

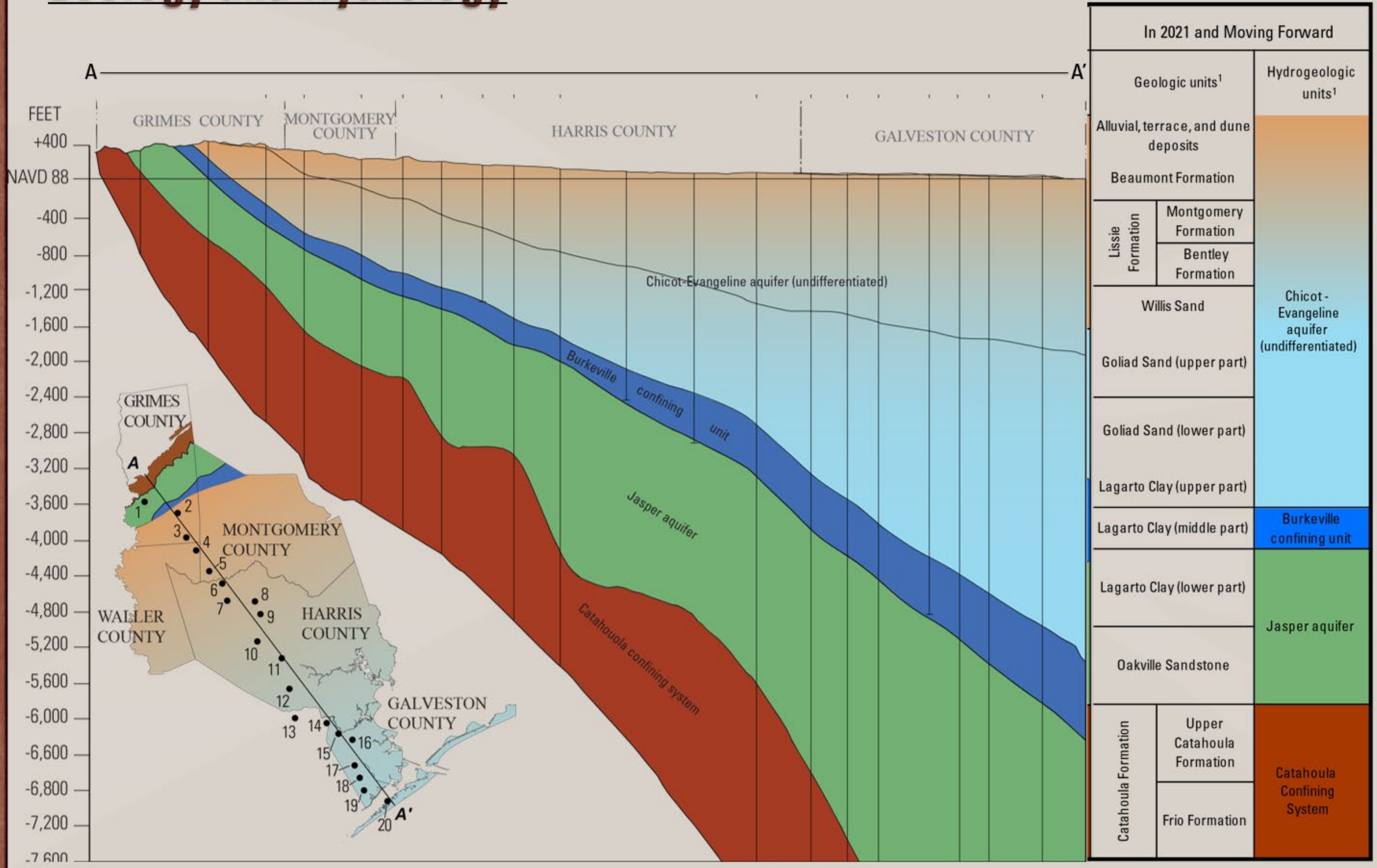
2024 Water-Level Map Series

- Chicot and Evangeline Aquifers (undifferentiated)
  - 2024 Water-Level Altitude
  - 2023 to 2024 Water-Level Change
  - 2019 to 2024 Water-Level Change
  - 1990 to 2024 Water-Level Change

- Compaction 1973 to 2023
  - Compaction Data from 14 Extensometers



Geology and Hydrology



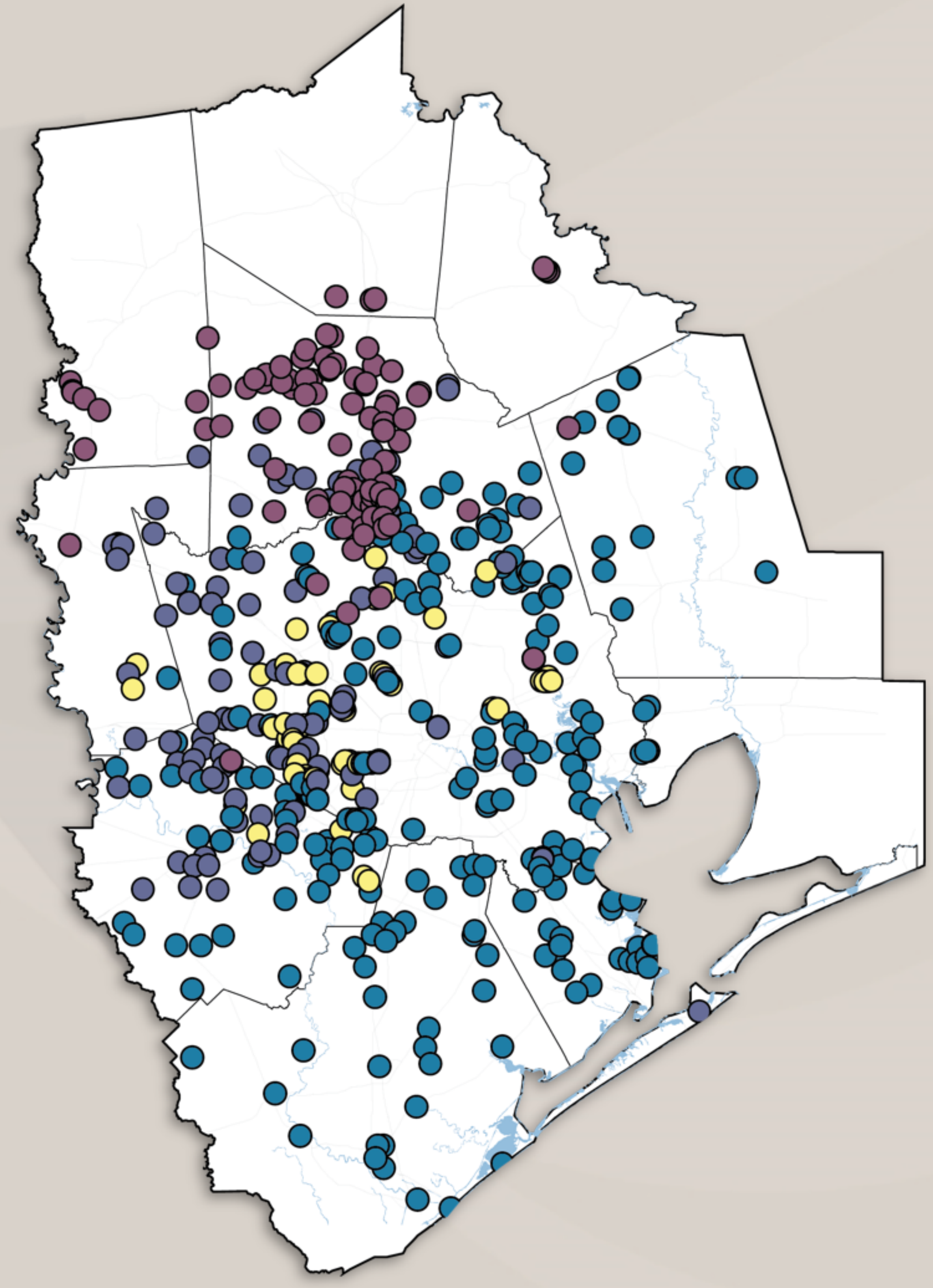
- Chicot and Evangeline aquifers (undifferentiated)
  - combined for annual regional-scale assessments
  - Updated aquifer tops and bases*
  - Chicot thickened across much of southeast Harris County
  - Distribution of Evangeline wells changed significantly

*Young, S.C., Kelley, V.A., Deeds, N., Hudson, C., Piemonti, D., Ewing, T.E., Banerji, D., Seifert, J., and Lyman, P., 2017

*Young, S.C., and Draper, C., 2020

Network

- Data collected across 11 counties
- Data collection from 12-12-2023 to 3-07-2024
- Well Types:
  - Public Supply, Irrigation, Industrial, Observation
- Chicot and Evangeline (undifferentiated) water-levels: **478**
  - 75 in Fort Bend County
- Number of wells used to create the 2024 altitude maps
  - Chicot and Evangeline (undifferentiated): *444*



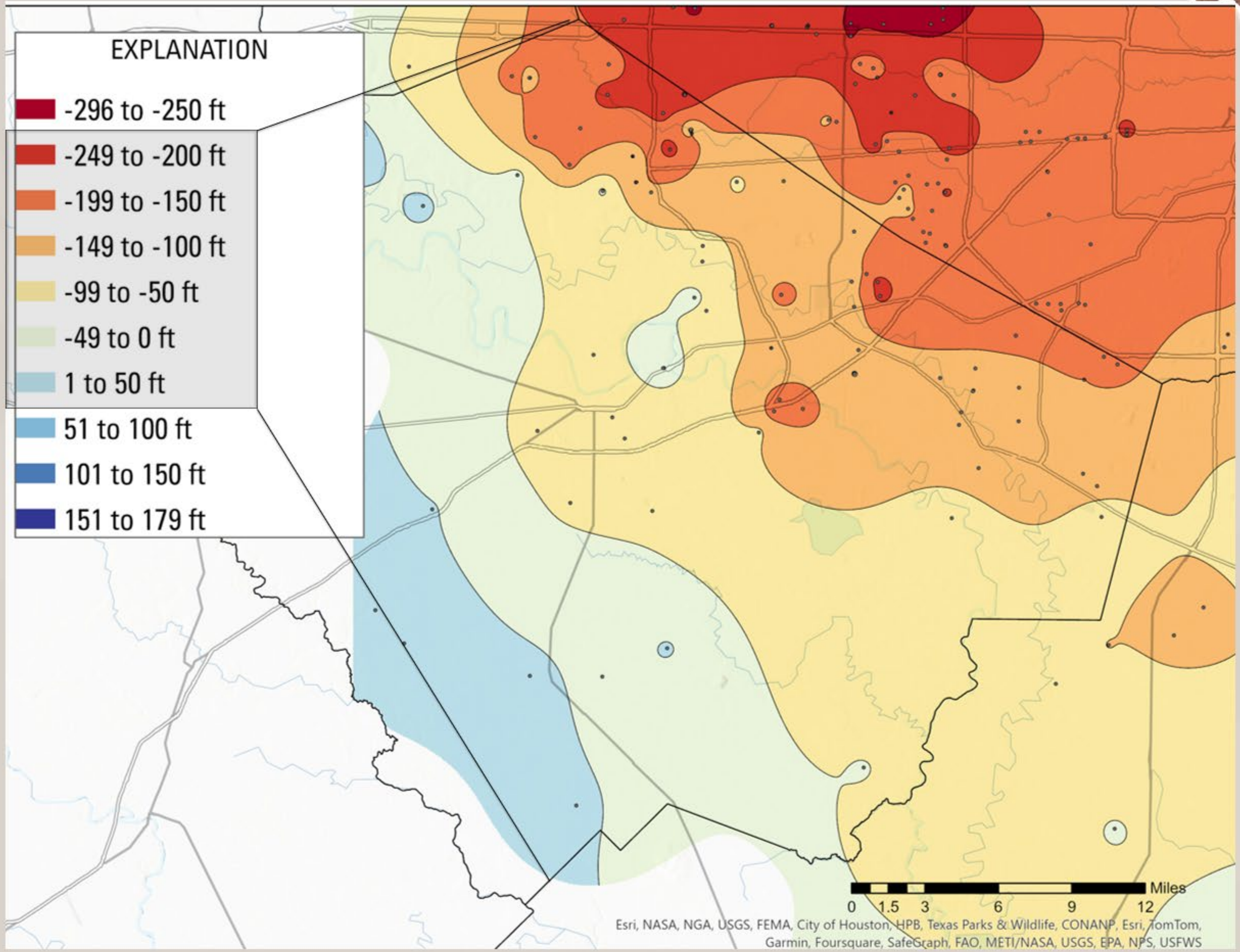
Water-Level Altitude

Chicot and Evangeline (undifferentiated)

Altitudes are referenced from NAVD 88

Lowest altitudes in northern and eastern portions of the county along the border with Harris County

Highest altitudes in the western portions of the county



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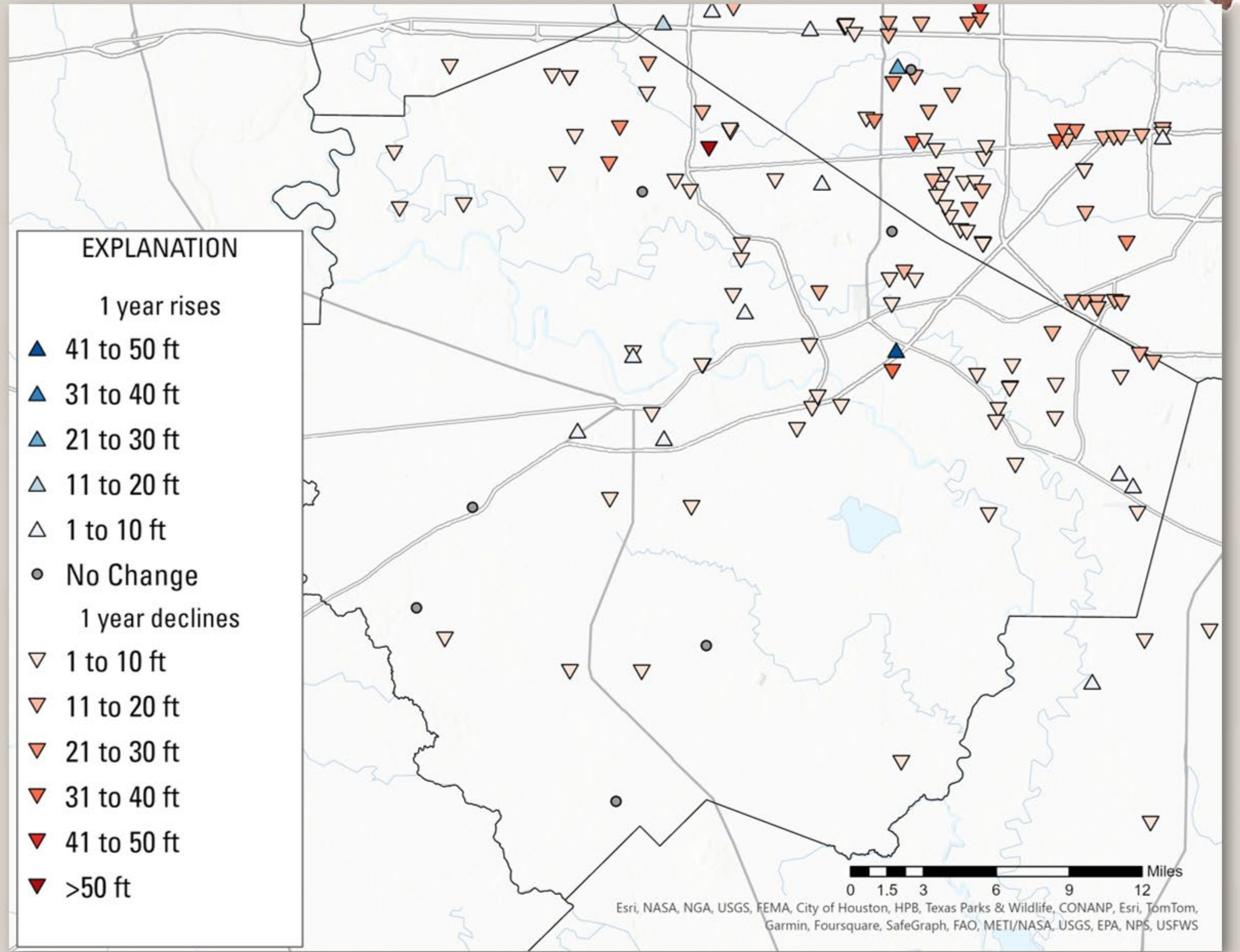
2023 to 2024 Water-Level Change

Chicot and Evangeline (undifferentiated)

- 72 water-level pairs
  - Mostly declines
    - About 71% are declines of less than 10 feet.
  - Largest decline (>50 ft):
    - Northern Fort Bend County (1)
  - Largest rise (>40 ft):
    - East-central Fort Bend County (1)



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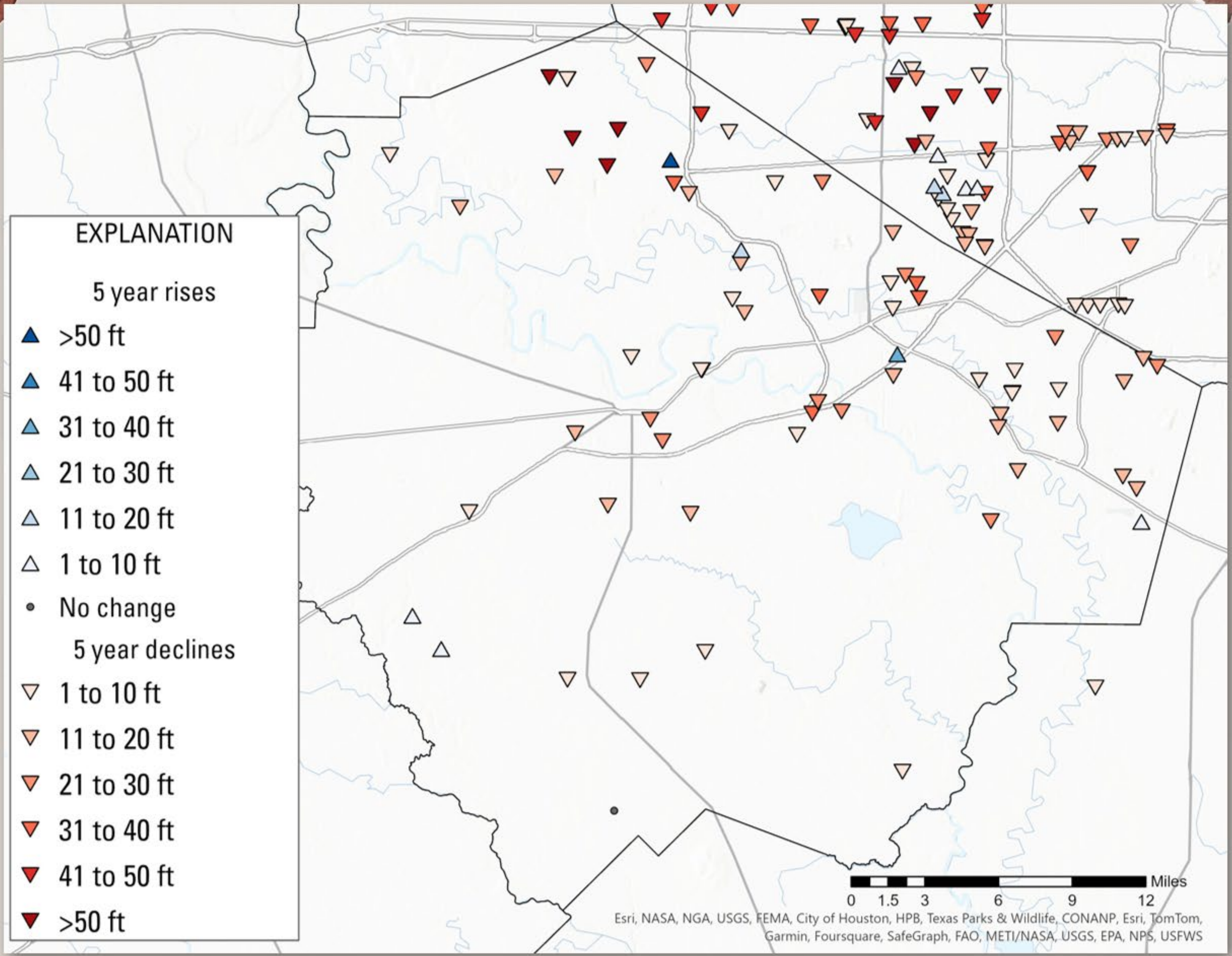
2019 to 2024 Water-Level Change

Chicot and Evangeline (undifferentiated)

- 70 water-level pairs
  - Mostly declines
    - More than half (~57%) are declines of less than 20 ft.
  - Largest declines (>50 ft):
    - Northern Fort Bend County
  - Largest rises (> 50 ft):
    - 1 in northern Fort Bend County



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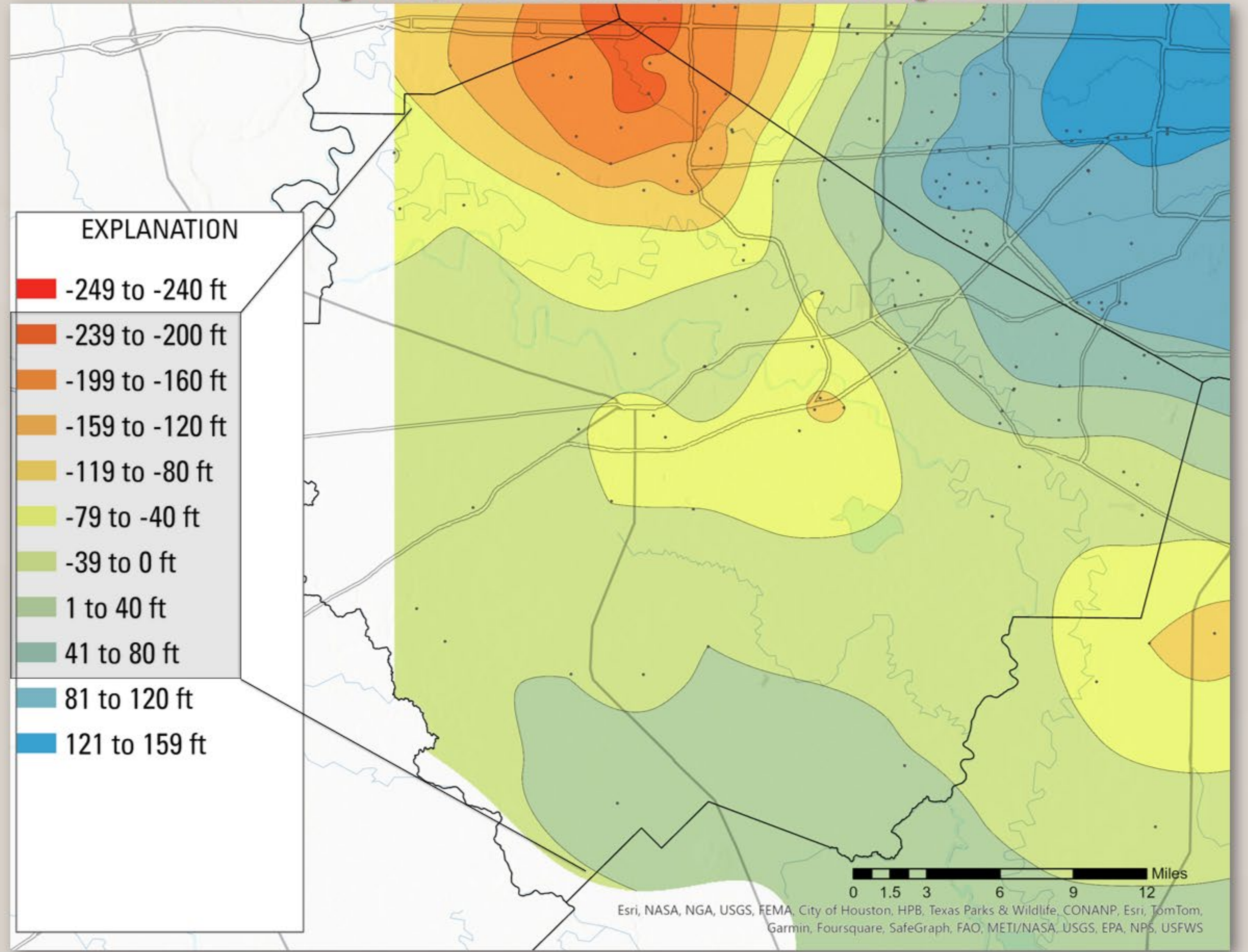
Long term change

Water level rises along the north-eastern border with Harris County and the southern border of Brazoria County

Water-level declines across much of the county with larger declines in the northern portion of the county

Chicot and Evangeline (undifferentiated) Water-Level Change 1990 to 2024



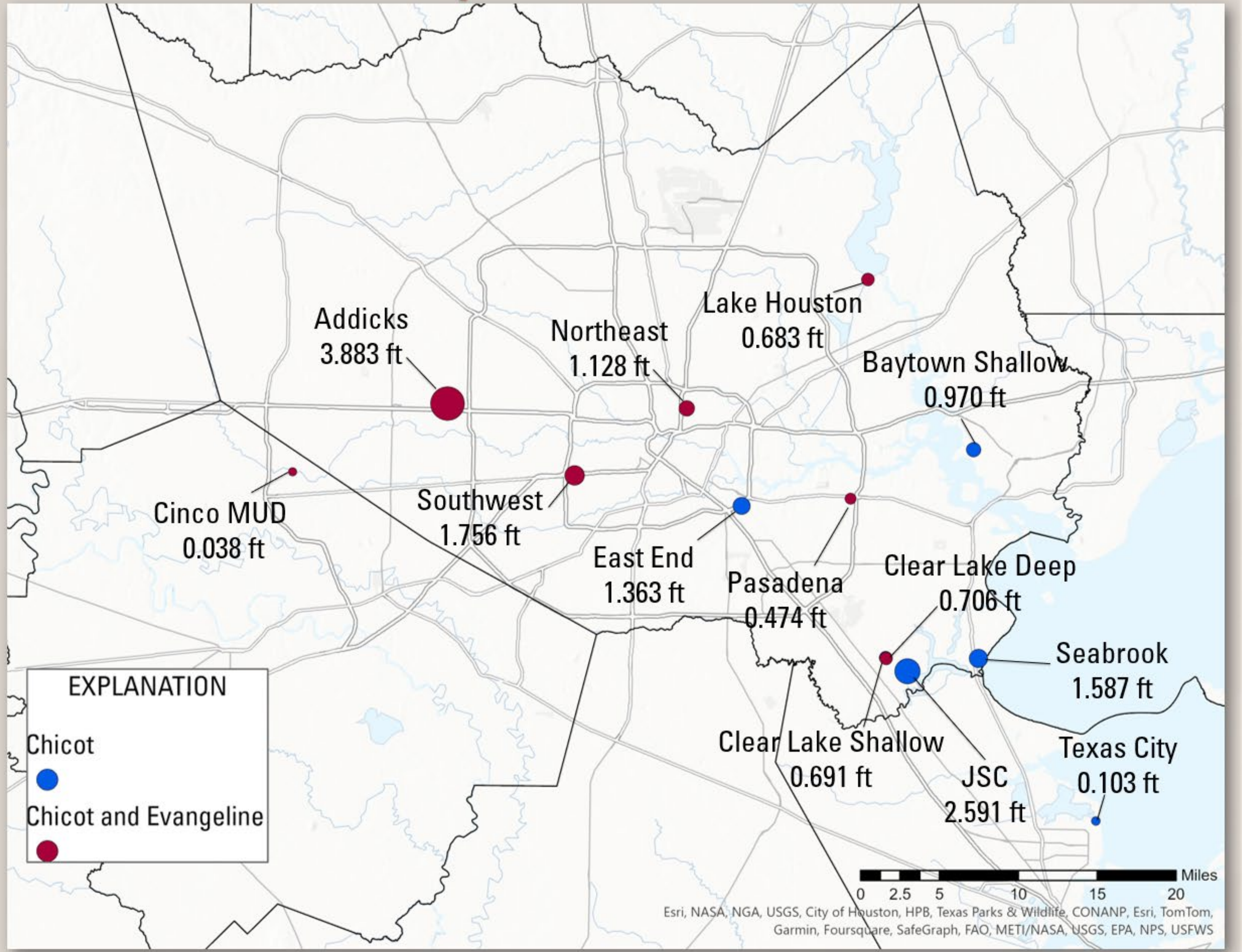
Compaction Interval:
Chicot

1. 1973 | Baytown Shallow 0.970 ft.
2. 1973 | East End 1.363 ft.
3. 1973 | Johnson Space Center 2.591 ft.
4. 1973 | Seabrook 1.587 ft.
5. 1973 | Texas City 0.103 ft.
6. 1976 | Clear Lake Shallow 0.691 ft.

Compaction Interval:
Chicot and Evangeline

7. 1973 | Baytown Deep --- ft.
8. 1974 | Addicks 3.883 ft.
9. 1974 | Pasadena 0.474 ft.
10. 1976 | Clear Lake Deep 0.706 ft.
11. 1980 | Lake Houston 0.683 ft.
12. 1980 | Northeast 1.128 ft.
13. 1980 | Southwest 1.756 ft.
14. 2017 | Cinco MUD 0.038 ft.

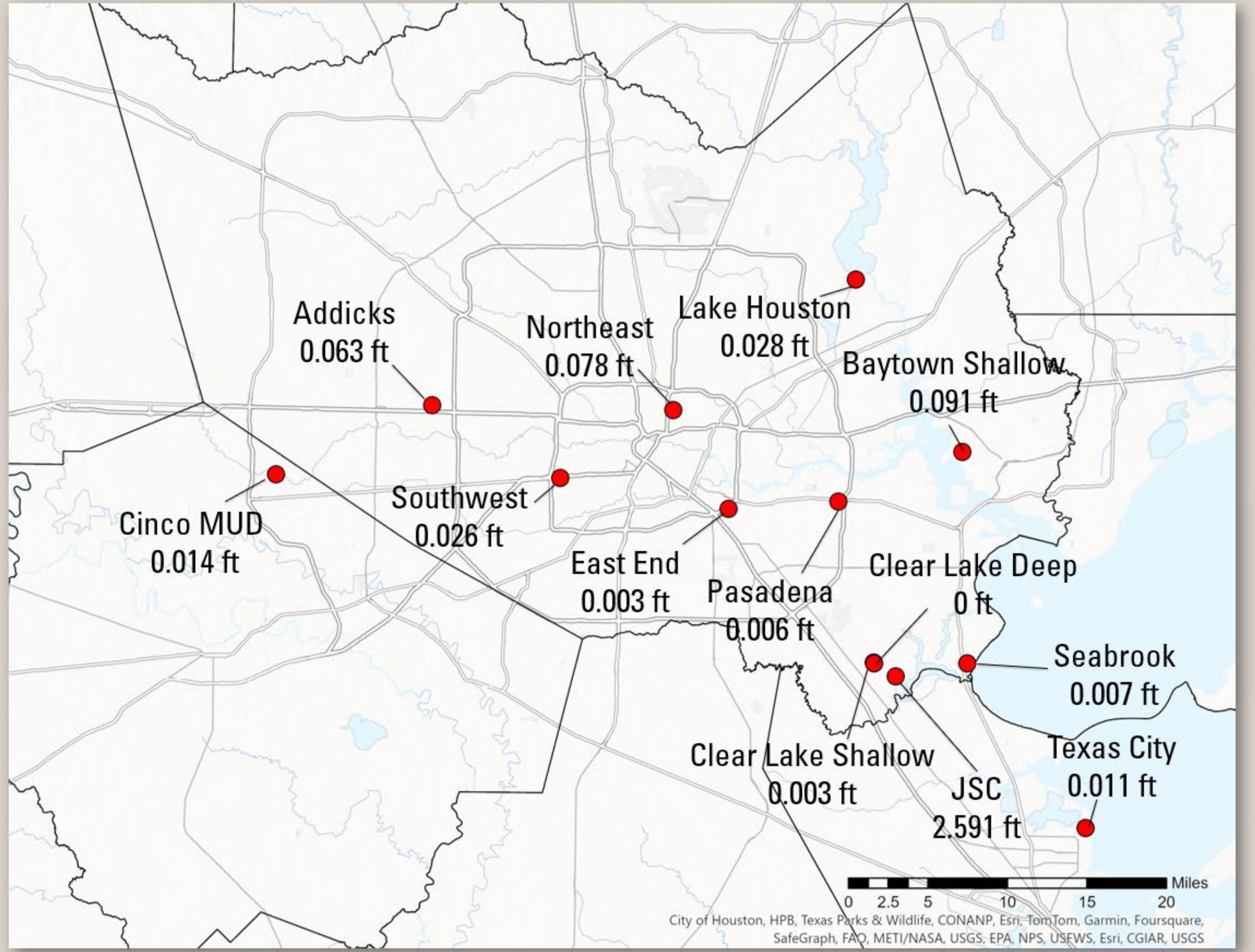
Compaction 1973 - 2023



2023 Compaction Summary

- No sites recorded expansion for the period
- Compaction ranged from 0.000 ft to 0.078 ft

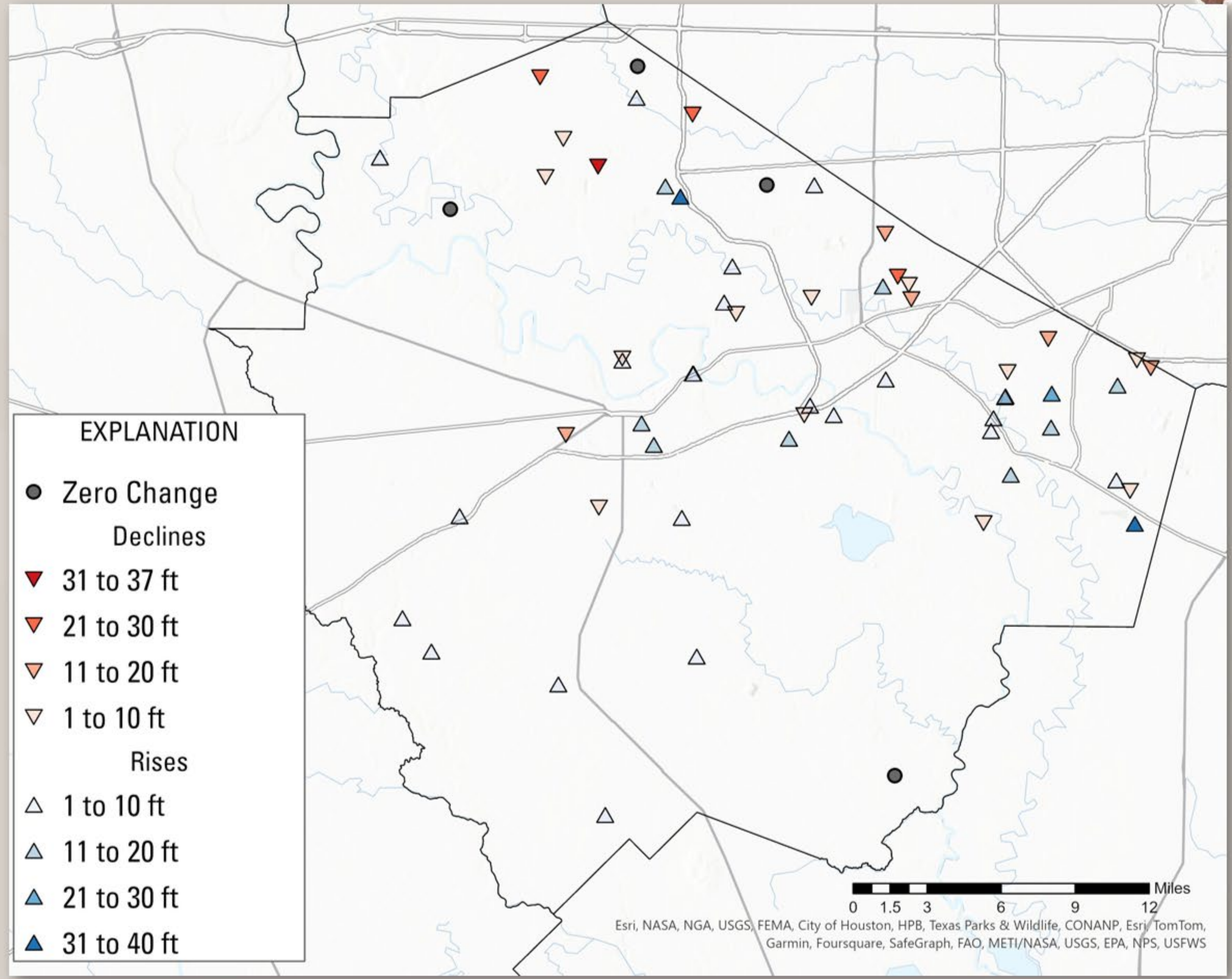
Compaction December 2022 to December 2023



Slide backups

2013 to 2024 Water-Level Change Magnitudes

- 69 water-level pairs
  - About 55% are rises
  - About 38% are declines
  - Largest declines (>30 ft):
    - Northern Fort Bend County
  - Rises across much of the county



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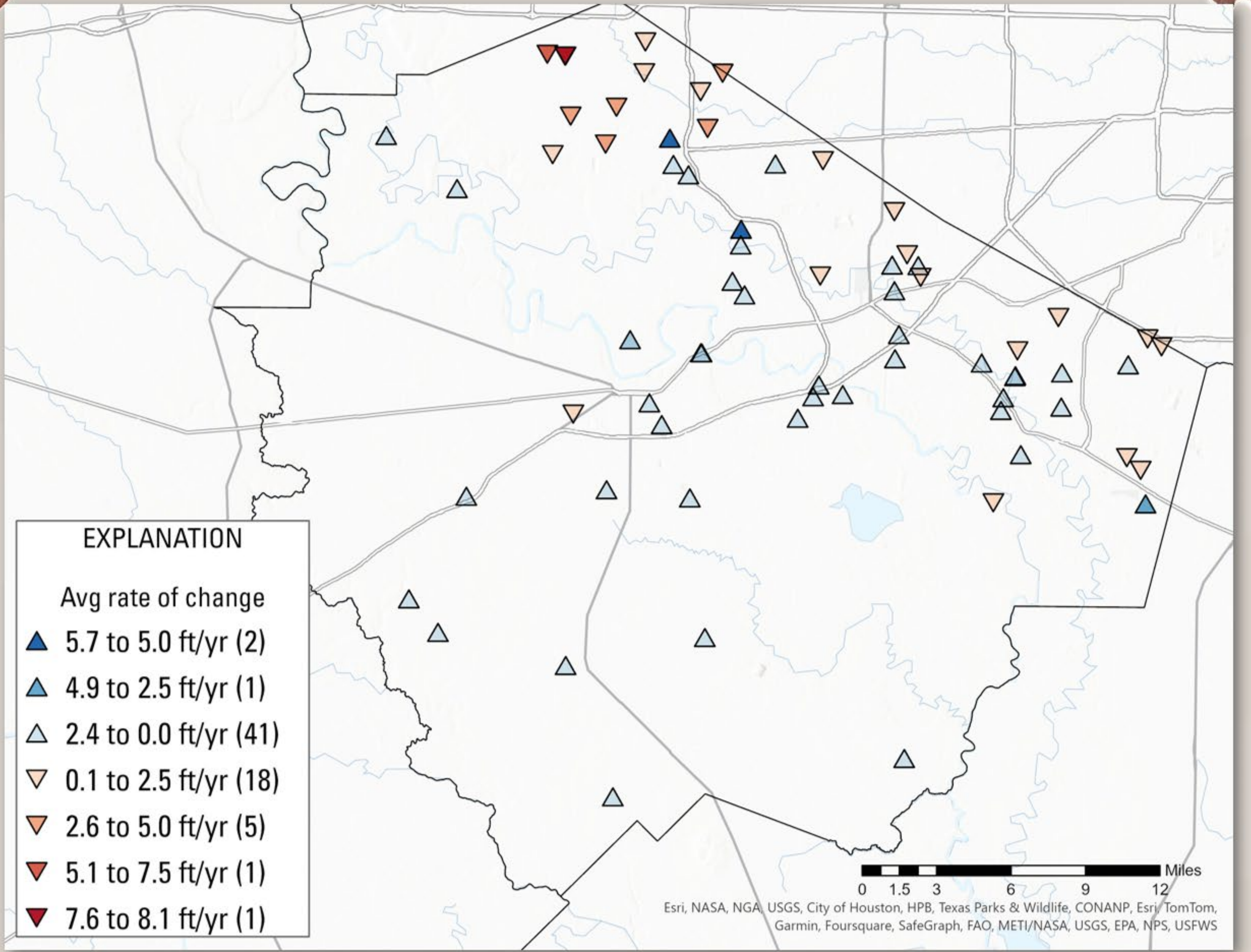
2013 to 2024 Water-Level Change

- Rate of change since 2013
  - Includes 5 wells beginning in 2014
  - About 64% show rises in water level, most of which have risen at a rate of about 2.4 ft/yr or less.
  - Declines occur primarily in northern Fort Bend county and adjacent to Harris County
    - Most are at rates of 2.5 ft/yr or less



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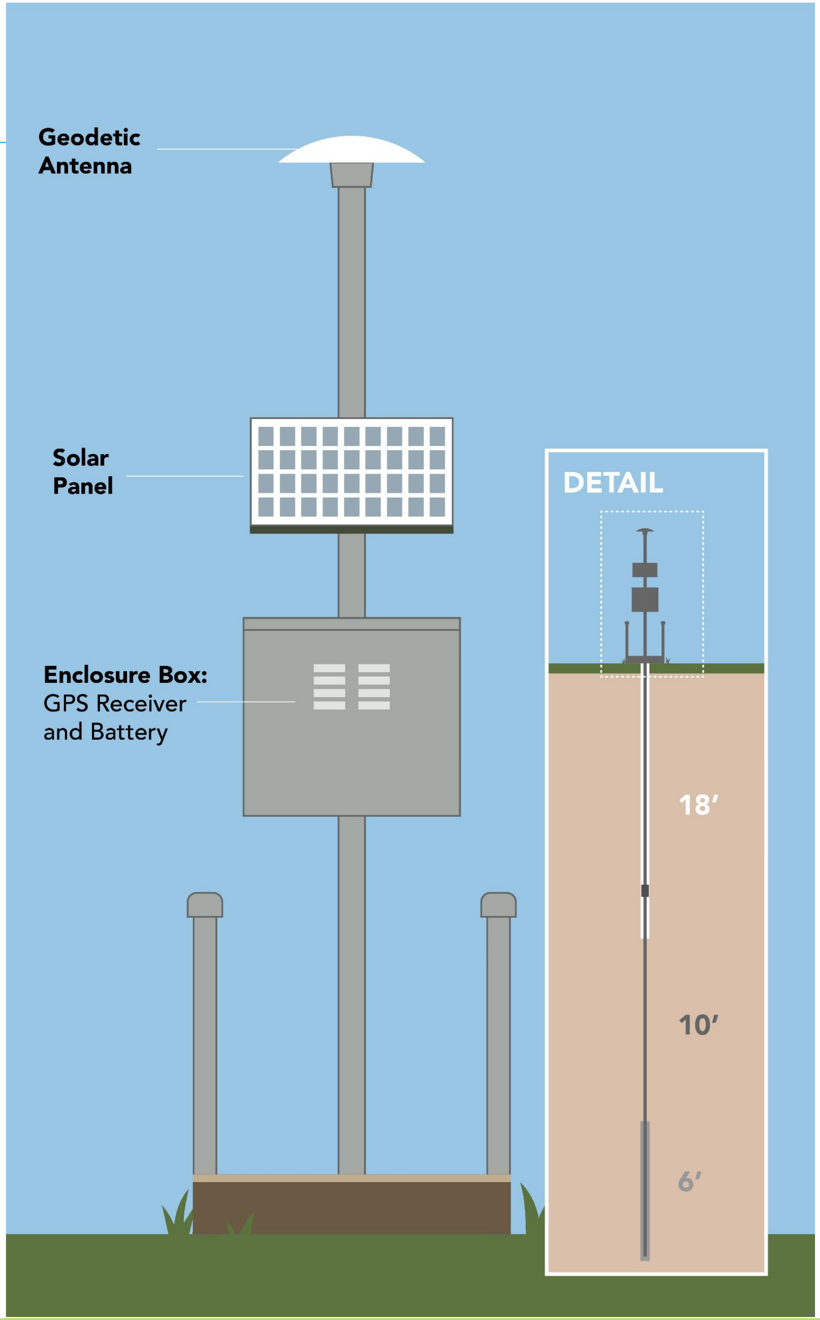
Subsidence Monitoring

All FBSD operated global positioning system (GPS) stations are constructed in a custom design.

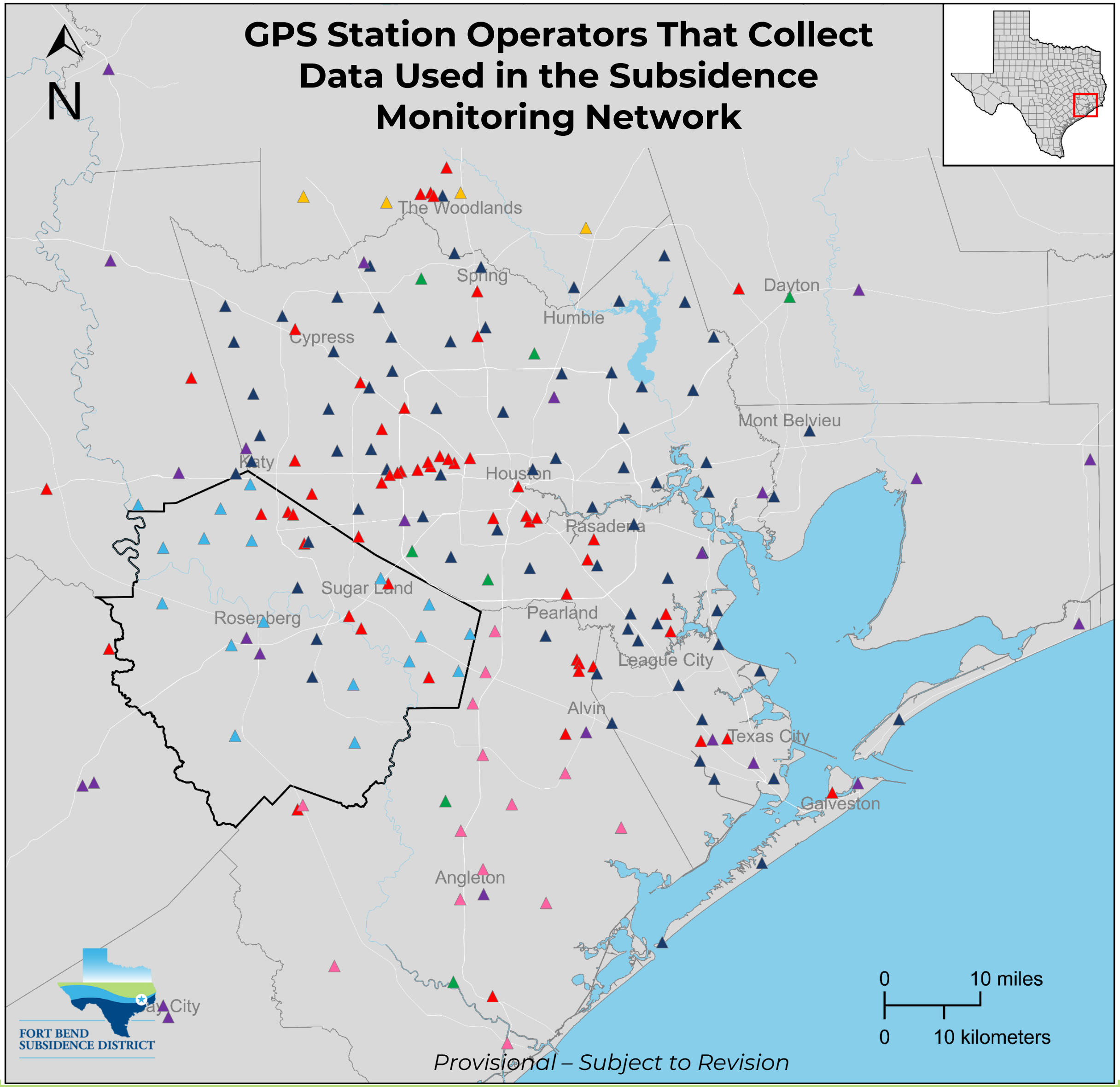
GPS data are collected for one week every two months.



FORT BEND SUBSIDENCE DISTRICT

Exhibit 9 Subsidence Monitoring Network

Location and operator of GPS stations that monitor land surface deformation periodically or continuously within southeast Texas in 2023.



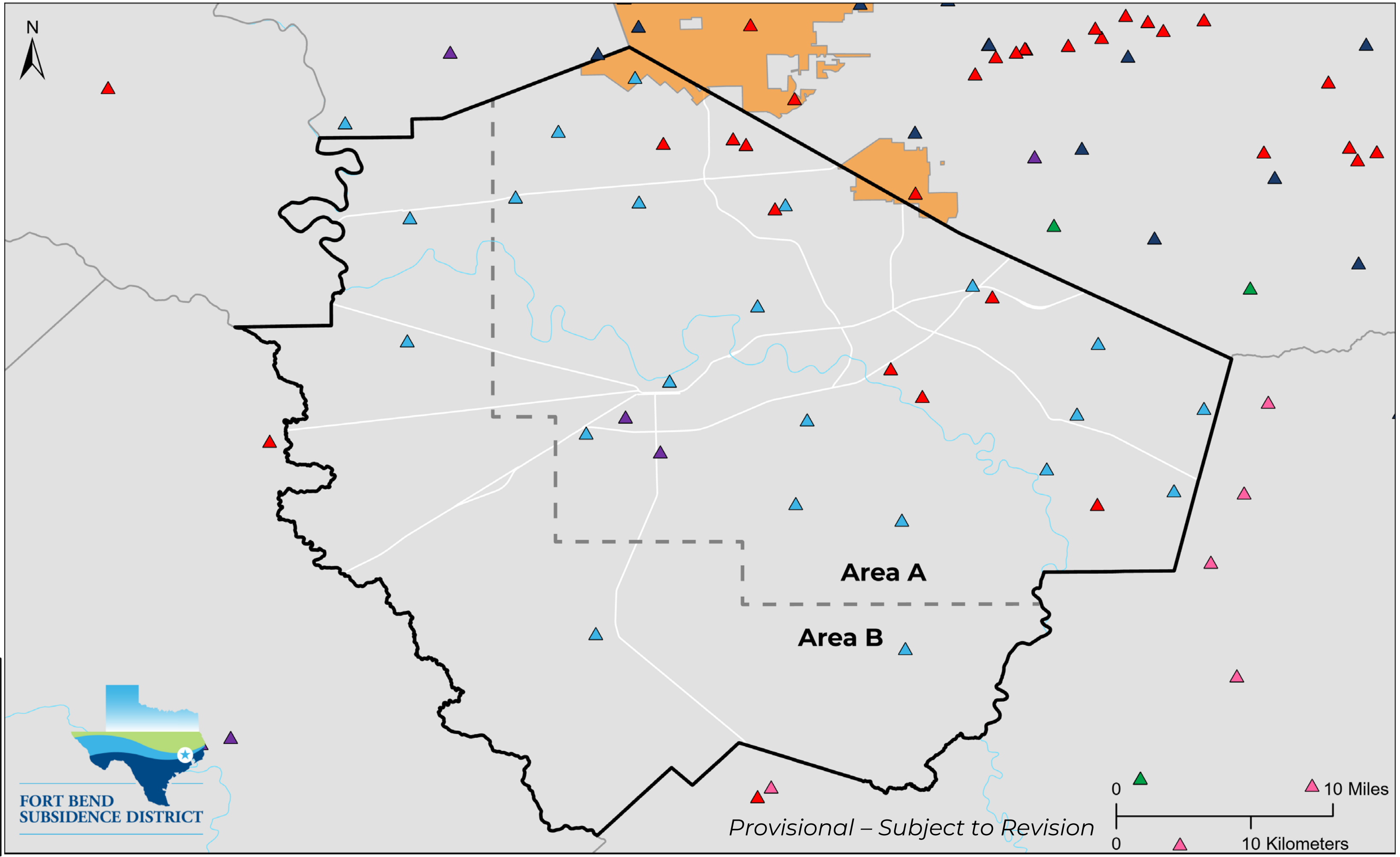
EXPLANATION

- FBSD Jurisdiction
- Harris-Galveston Subsidence District
- Fort Bend Subsidence District
- University of Houston
- Texas Department of Transportation
- Brazoria County Groundwater Conservation District
- Lone Star Groundwater Conservation District
- Other Operators

Exhibit 10 GPS Station Operators

FORT BEND SUBSIDENCE DISTRICT

Location of GPS station operators and jurisdiction of FBSD and the West Harris County Regional Water Authority (WHCRWA), who is not permitted by FBSD.



EXPLANATION

GPS Stations Used in the Subsidence Monitoring Network

- FBSD
- HGSD
- UH
- TxDOT
- BCGCD
- LSGCD
- Other
- WHCRWA

Exhibit 11 Subsidence Rates in Fort Bend

Annual subsidence rate, in centimeters per year (cm/yr.), estimated from GPS data collected at active stations with three or more years of data averaged from 2019 to 2023.

EXPLANATION

Average Annual Subsidence Rate (cm/yr.) Estimated from GPS Data Collected from Active GPS Stations from 2019 to 2023

- Greater than 2.0
- 2.0 - 1.5
- 1.5 - 1.0
- 1.0 - 0.5
- Less than 0.5

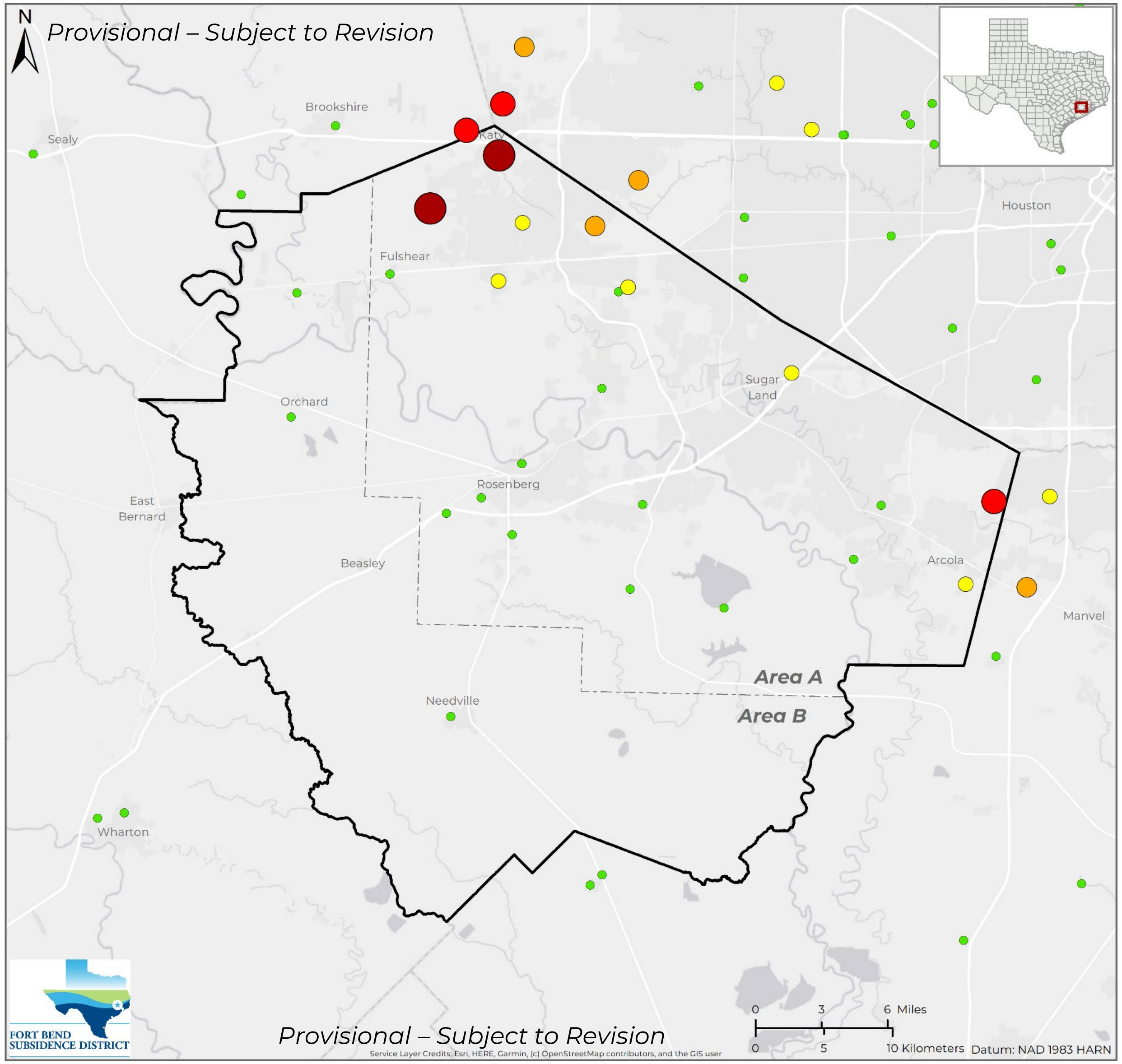
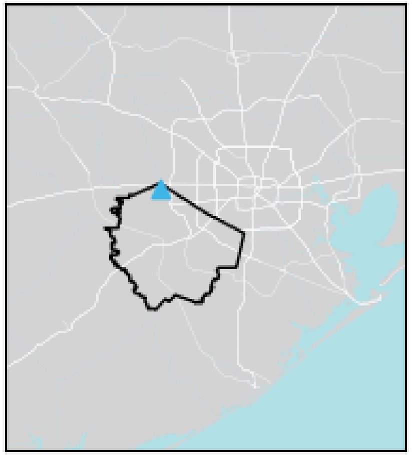
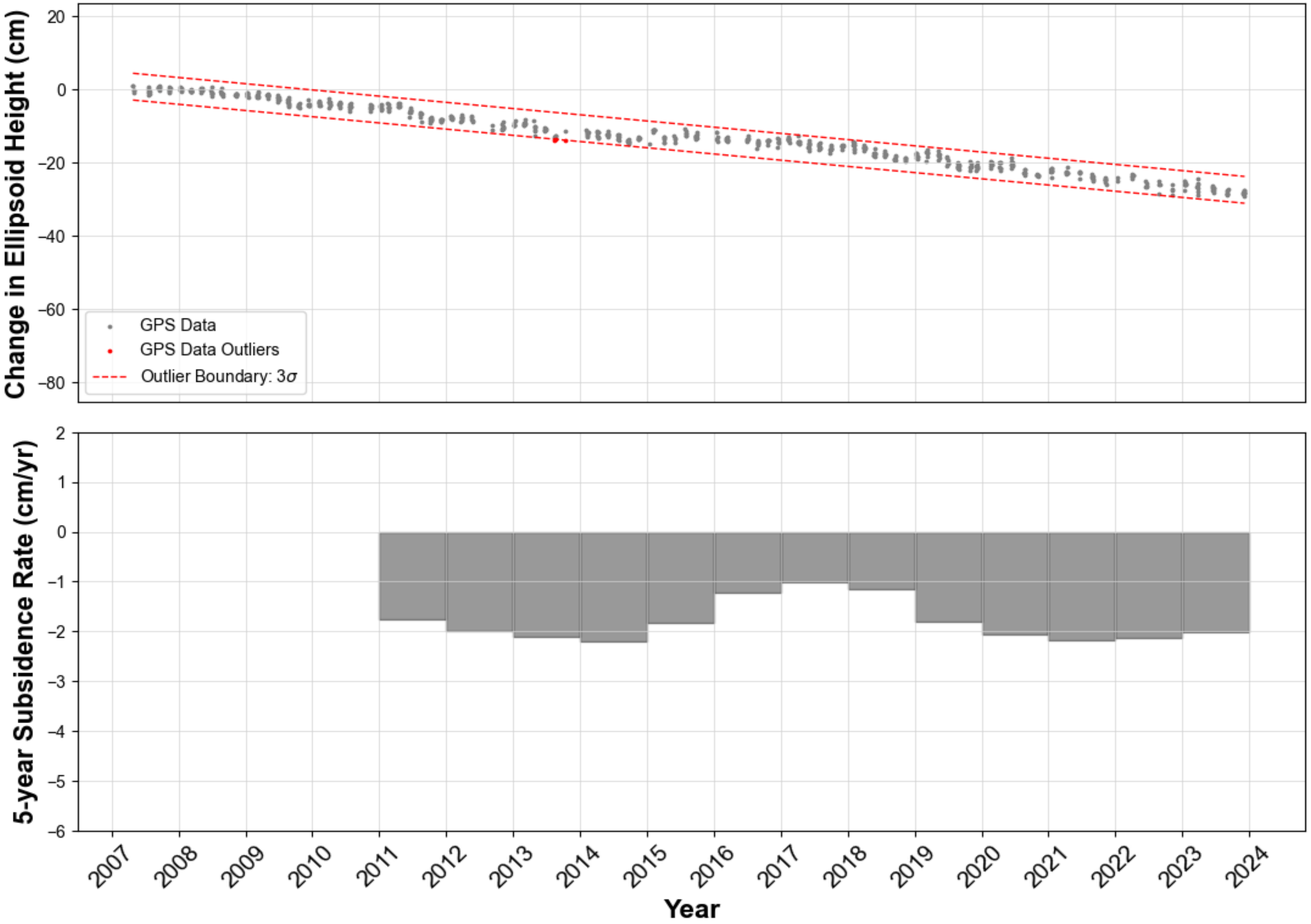


Exhibit 12 Subsidence Data in Katy

- GPS station P029, located in Katy, has measured a total of approximately 28.5 cm of subsidence since 2007.
- 2019-2023 average annual subsidence rate is 2.03 cm/yr.



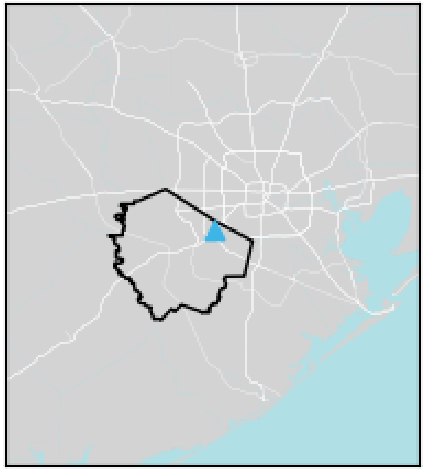


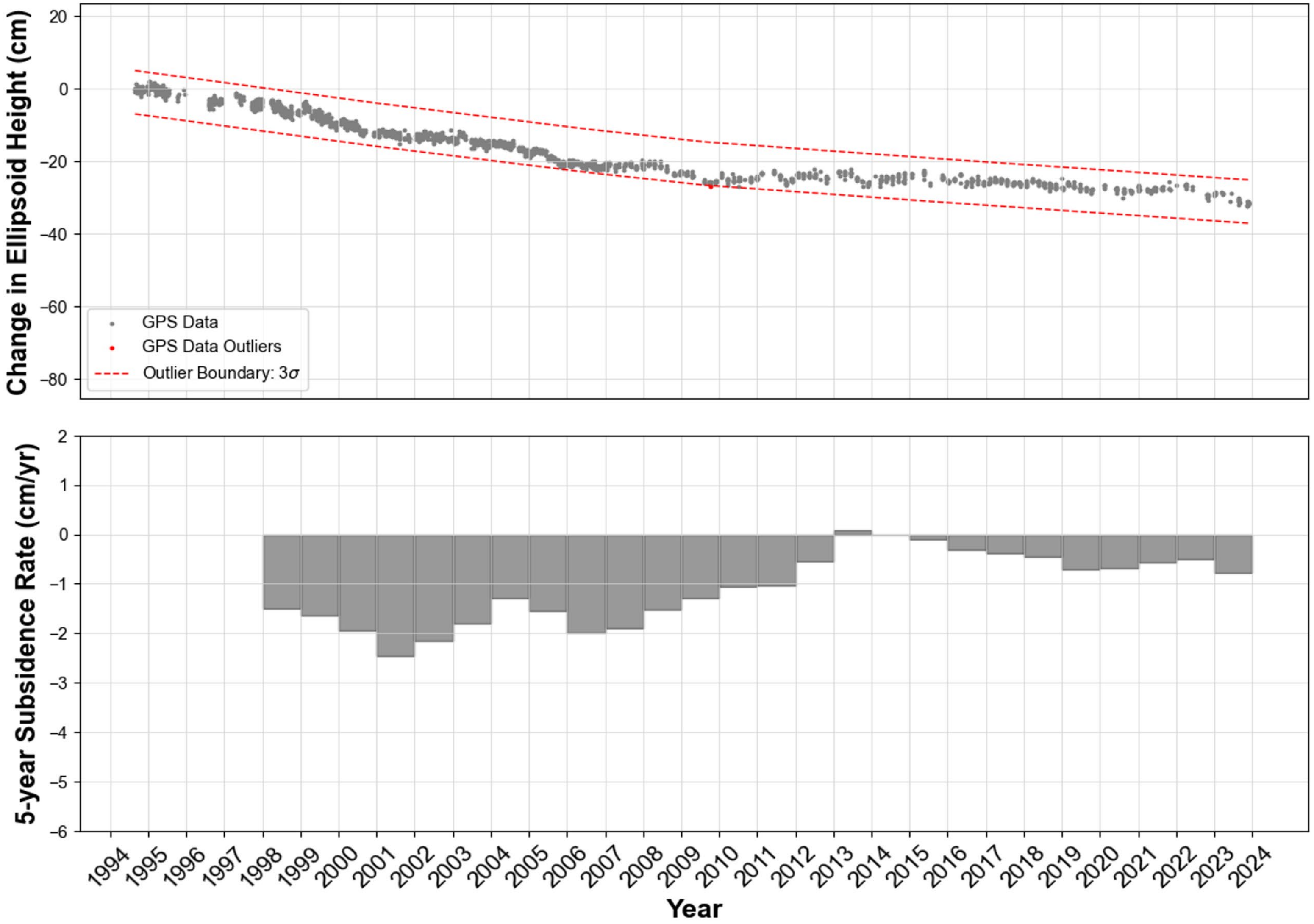
Processed GPS data (source: UH) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed lines) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by the District when calculating subsidence rates and are shown for informational purposes only.

Provisional – Subject to Revision

Exhibit 13 Subsidence Data in Sugar Land

- GPS station P004, located in Sugar Land, has measured a total of approximately 31.3 cm of subsidence since 1994.
- 2019-2023 average annual subsidence rate is 0.77 cm/yr.

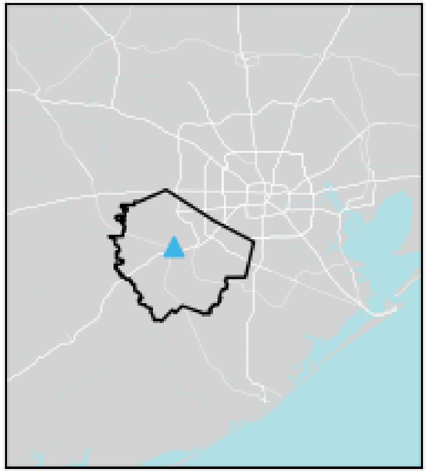


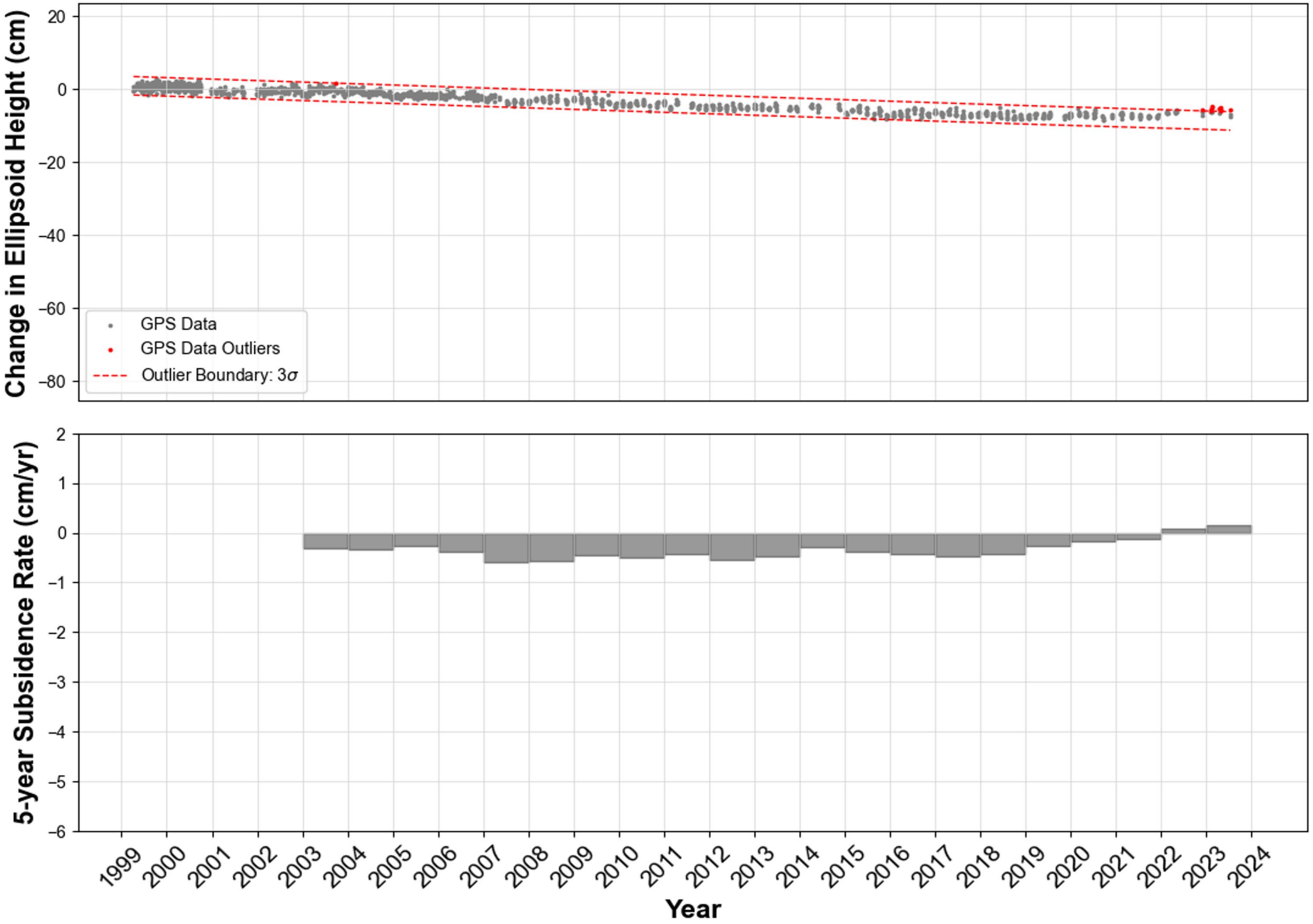


Processed GPS data (source: UH) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed lines) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by the District when calculating subsidence rates and are shown for informational purposes only.

Exhibit 14 Subsidence Data in Rosenberg

- GPS station P010, located in Rosenberg, has measured a total of approximately 6.4 cm of subsidence since 1999.
- 2019-2023 average annual subsidence rate is -0.31 cm/yr. (Uplift of 0.31 cm/yr.).





Processed GPS data (source: UH) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed lines) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by the District when calculating subsidence rates and are shown for informational purposes only.

Testimony and Public Comment

Any person who wishes to present testimony, evidence, exhibits or other information may do so in person, by counsel, via email to **fbinfo@subsidence.org** or any combination of these options.

FORT BEND SUBSIDENCE DISTRICT

Thank You for Attending the Public Hearing for FBSD's 2023 Annual Groundwater Report

- Record will be open until **May 3, 2024**. You may provide comments by sending an email to **fbinfo@subsidence.org**
- The 2023 Annual Groundwater Report will be presented to the Fort Bend Subsidence District Board of Directors on **May 22, 2024**.
- The 2023 Annual Groundwater Report will be posted on FBSD's website upon approval from the Board of Directors.

Contact Information

301 Jackson St. Ste 639
Richmond, TX 77469

(281)342-3273

fbinfo@subsidence.org

www.fbsubsidence.org

FORT BEND
SUBSIDENCE DISTRICT

Appendix B – Period of Record Data

A comprehensive table is provided which includes the GPS station name, coordinates in decimal degrees, dates of operation, length of monitoring in decimal years, total vertical displacement over the period of record, and annual rate of change in ellipsoidal height from 2019 to 2023. A period of record plot and five-year rate bar graph are also included for each GPS station that was actively monitored in 2023.

Site Name	Latitude (Decimal degrees)	Longitude (Decimal degrees)	Start of POR (Decimal year)	End of POR (Decimal Year)	Length of POR (Years)	Number of Samples (Days)	Total Vertical Displacement over POR (cm)	Annual Rate of Change in Ellipsoidal Height 2018-2022 (cm/yr.)
ADKS	29.791	-95.586	1993.520	2023.999	30.479	9124	-2.6	-0.08
ALEF	29.692	-95.635	2014.259	2023.674	9.416	3421	-6.6	-0.47
AULT	29.998	-95.745	2015.557	2023.395	7.838	2795	-8.7	-1.10
CFHS	29.919	-95.632	2015.595	2023.674	8.079	2884	-12.5	-1.08
CFJV	29.882	-95.556	2015.773	2023.674	7.901	2869	-7.9	-0.74
CMFB	29.681	-95.729	2014.409	2023.674	9.265	3339	-5.8	-0.43
COH2	29.629	-95.412	2009.005	2023.058	14.053	4441	-3.3	0.18
COH6	30.040	-95.185	2004.249	2023.777	19.528	3259	-9.3	-0.31
COTM	29.394	-94.998	2015.097	2023.674	8.578	2864	-1.4	-0.01
CSTE	29.796	-95.511	2015.387	2023.450	8.063	2942	-3.5	-0.19
DISD	29.289	-95.740	2015.480	2023.524	8.044	2778	1.7	0.27
DMFB	29.623	-95.584	2014.771	2023.672	8.901	3239	-5.6	-0.24
DWI1	29.014	-95.404	2009.399	2023.529	14.130	4765	-1.5	0.11
FSFB	29.556	-95.630	2014.371	2023.674	9.303	3252	-2.3	-0.31
GSEC	30.197	-95.528	2015.756	2024.033	8.277	2588	-6.2	-0.91
HCC1	29.788	-95.561	2012.914	2023.674	10.760	3905	-7.6	-0.44
HPEK	29.755	-95.716	2014.396	2023.636	9.240	2237	-13.7	-1.44
HSMN	29.800	-95.470	2013.298	2023.672	10.374	3762	-4.3	-0.16
JGS2	30.045	-94.891	2012.463	2023.529	11.066	3750	0.5	0.34
KKES	29.850	-95.595	2015.598	2023.395	7.797	2428	-9.4	-1.09
KPCD	29.926	-95.924	2016.441	2023.996	7.556	2760	-3.3	-0.22
KPCS	29.926	-95.924	2016.441	2023.646	7.205	2176	-2.6	-0.15
LCBR	30.182	-96.602	2010.538	2023.529	12.991	3075	-1.1	-0.04
LGC1	30.045	-94.075	2013.531	2024.033	10.502	3258	0.5	0.04
LKHU	29.913	-95.146	1994.731	2023.999	29.268	9870	1.2	0.15
MDWD	29.771	-95.595	2013.303	2023.672	10.368	3722	-8.3	-0.54
MEPD	29.658	-95.240	2014.040	2023.672	9.632	3404	1.6	0.23
MRHK	29.804	-95.745	2014.396	2023.672	9.276	3266	-16.8	-1.65
N301	29.311	-94.792	2018.530	2024.071	5.541	1930	-0.4	0.15
NASA	29.552	-95.096	2014.201	2023.069	8.868	3016	0.4	0.17
NETP	29.791	-95.334	1993.517	2023.999	30.482	8782	-0.3	-0.08
OKEK	29.725	-95.803	2014.576	2023.395	8.819	3149	-7.2	-0.92
P100	29.934	-95.198	2019.309	2023.813	4.504	283	-0.8	-0.06
P101	28.945	-95.378	2019.717	2023.276	3.559	88	-0.7	-0.10
P103	29.151	-95.311	2019.712	2023.279	3.567	94	-0.7	-0.27
P106	29.552	-95.400	2019.695	2023.832	4.137	127	-2.0	-0.58
P108	29.772	-95.121	2021.244	2023.966	2.723	158	-0.9	-0.19
P109	29.986	-95.022	2021.148	2023.890	2.742	157	2.3	1.43
P110	29.548	-95.442	2021.189	2023.851	2.663	104	-4.6	-1.92
P111	29.733	-95.873	2021.285	2023.950	2.665	100	-8.2	-3.18
P112	29.201	-95.420	2022.361	2023.142	0.781	11	-0.0	n/a
P113	29.388	-95.642	2023.337	2023.813	0.476	23	-0.1	n/a
P114	29.592	-95.513	2023.411	2023.871	0.460	24	-0.8	n/a
P000	29.539	-95.152	1996.003	2023.890	27.887	1765	-1.3	-0.01
P001	29.912	-95.617	1994.164	2023.547	29.383	2253	-72.2	-0.15
P002	30.001	-95.416	1994.318	2023.986	29.668	2230	-67.0	-1.14
P003	29.821	-95.613	1994.328	2023.849	29.520	1773	-56.8	-0.61
P004	29.630	-95.597	1994.660	2023.909	29.249	2055	-31.3	-0.69

Site Name	Latitude (Decimal degrees)	Longitude (Decimal degrees)	Start of POR (Decimal year)	End of POR (Decimal Year)	Length of POR (Years)	Number of Samples (Days)	Total Vertical Displacement over POR (cm)	Annual Rate of Change in Ellipsoidal Height 2018-2022 (cm/yr.)
P005	29.791	-95.586	1996.698	2023.906	27.208	1793	-34.7	-0.61
P006	29.818	-95.672	2014.276	2023.849	9.572	459	-8.3	0.02
P007	29.936	-95.577	1999.115	2023.928	24.813	1593	-58.7	0.19
P008	29.980	-95.476	1999.610	2023.986	24.375	1486	-43.5	-1.14
P009	30.038	-95.071	1999.345	2023.903	24.559	1539	-4.8	-0.56
P010	29.566	-95.799	1999.266	2023.537	24.271	1736	-6.4	0.31
P011	30.032	-95.865	1999.345	2023.104	23.759	1571	-9.7	0.19
P012	30.060	-95.263	2000.895	2023.791	22.896	1490	-12.7	-0.99
P013	30.195	-95.490	2000.914	2023.999	23.085	1408	-27.5	-0.78
P014	29.474	-95.644	2000.879	2023.832	22.953	1282	-5.4	0.07
P016	29.544	-95.527	2000.860	2023.860	23.000	1335	-5.8	-0.09
P017	30.091	-95.615	2000.895	2023.909	23.014	1302	-37.6	-0.60
P018	29.965	-95.678	2000.862	2022.170	21.307	1286	-34.4	-0.74
P019	29.841	-95.805	2000.892	2023.999	23.107	1267	-22.2	-1.23
P020	29.533	-95.013	2002.047	2023.944	21.898	1313	1.9	0.44
P021	29.545	-95.312	2002.082	2023.871	21.788	1231	0.3	0.47
P022	29.335	-95.021	2002.041	2023.931	21.890	1259	-4.6	0.05
P023	29.335	-94.918	2002.060	2023.931	21.871	1344	1.7	0.26
P024	29.669	-95.041	2002.118	2023.988	21.871	1288	7.0	0.27
P026	29.210	-94.938	2002.194	2023.999	21.805	3115	-0.7	0.10
P027	29.583	-95.016	2002.367	2023.966	21.600	1278	-4.5	0.10
P028	29.751	-94.918	2002.194	2023.988	21.794	1273	1.1	0.08
P029	29.769	-95.822	2007.320	2023.931	16.610	737	-28.0	-2.03
P030	29.689	-95.902	2007.350	2023.950	16.600	736	-7.6	-0.43
P031	29.398	-95.848	2007.350	2023.813	16.463	725	3.1	0.40
P032	29.541	-95.707	2007.350	2023.786	16.435	744	-0.8	0.10
P033	29.490	-95.224	2006.323	2023.871	17.548	926	-1.9	-0.09
P034	29.422	-95.042	2010.356	2023.988	13.632	4594	-3.6	0.32
P035	29.473	-95.082	2006.621	2023.887	17.266	782	3.9	0.37
P036	29.494	-94.942	2006.966	2023.947	16.981	807	0.0	0.71
P037	29.631	-95.101	2007.383	2023.966	16.583	669	2.8	0.54
P038	29.649	-95.223	2007.356	2023.999	16.643	849	4.4	0.19
P039	29.645	-95.339	2011.093	2023.999	12.906	641	-1.0	-0.02
P040	29.493	-95.462	2007.353	2023.851	16.498	680	-9.8	-0.50
P041	29.662	-95.476	2007.337	2023.928	16.591	843	-10.8	-0.29
P042	29.732	-95.635	2007.331	2023.906	16.575	792	-11.0	-0.11
P043	29.093	-95.111	2006.545	2023.999	17.454	2949	-1.0	0.03
P044	29.880	-95.687	2007.320	2023.871	16.550	775	-20.1	-0.62
P045	29.876	-95.385	2007.331	2023.964	16.633	834	-5.5	-0.23
P046	30.030	-95.600	2007.323	2023.884	16.561	787	-24.8	-0.76
P047	30.090	-95.424	2007.339	2023.999	16.660	799	-30.5	-1.83
P048	30.045	-95.672	2007.320	2023.914	16.594	765	-16.8	-0.32
P049	29.422	-94.702	2006.279	2023.999	17.720	2434	-2.4	-0.32
P050	29.848	-94.856	2006.835	2023.988	17.153	874	-2.1	-0.15
P051	29.933	-95.284	2007.339	2023.813	16.474	812	-10.0	-0.49
P052	29.852	-95.177	2007.339	2023.966	16.627	798	-1.4	-0.04
P053	29.908	-95.057	2007.339	2023.756	16.416	757	-3.9	-0.27
P054	29.801	-95.034	2006.816	2023.871	17.055	870	-0.9	-0.10

Site Name	Latitude (Decimal degrees)	Longitude (Decimal degrees)	Start of POR (Decimal year)	End of POR (Decimal Year)	Length of POR (Years)	Number of Samples (Days)	Total Vertical Displacement over POR (cm)	Annual Rate of Change in Ellipsoidal Height 2018-2022 (cm/yr.)
P055	29.794	-95.177	2006.799	2023.944	17.145	823	2.7	0.02
P056	29.903	-95.817	2007.320	2023.964	16.643	683	-6.6	0.27
P057	29.684	-95.722	2009.137	2023.890	14.753	629	-7.5	-0.51
P058	29.485	-95.715	2010.591	2023.794	13.203	596	-2.8	-0.02
P059	29.617	-95.740	2010.572	2023.756	13.183	592	-3.1	-0.13
P060	29.686	-95.820	2012.071	2023.931	11.860	487	-8.8	-0.58
P061	29.675	-95.972	2011.129	2023.966	12.838	582	-4.3	0.07
P062	29.593	-95.974	2011.126	2023.999	12.873	533	-4.7	-0.06
P063	29.508	-95.547	2011.432	2023.832	12.400	557	-2.2	0.11
P065	30.106	-95.107	2012.432	2023.909	11.476	559	-6.4	0.19
P066	30.017	-95.767	2011.167	2023.944	12.777	593	-15.0	-0.59
P067	29.532	-95.855	2011.109	2023.999	12.890	564	-3.3	0.07
P068	30.185	-95.587	2011.799	2023.999	12.200	729	-13.7	-1.19
P069	30.199	-95.459	2011.747	2023.909	12.161	736	-14.2	-1.09
P070	30.291	-95.424	2011.761	2023.947	12.186	683	-6.1	-0.09
P071	30.353	-95.579	2011.780	2023.966	12.186	760	-5.7	-0.37
P072	30.147	-95.242	2011.994	2023.808	11.814	568	-9.3	-0.64
P073	30.193	-95.730	2012.052	2023.988	11.936	747	-10.5	-0.79
P074	29.736	-95.231	2011.972	2023.944	11.973	565	3.1	0.42
P075	29.758	-95.031	2012.432	2023.871	11.438	587	-0.1	0.37
P076	29.361	-95.045	2012.643	2023.909	11.266	535	-5.3	-0.27
P077	29.979	-95.850	2013.197	2023.966	10.769	465	-2.3	0.34
P078	29.739	-96.016	2014.331	2023.966	9.635	452	-3.3	-0.03
P079	29.035	-95.471	2014.827	2023.999	9.172	2616	-1.6	-0.16
P080	29.578	-95.165	2014.862	2023.999	9.137	3177	0.4	0.22
P081	29.556	-95.170	2014.854	2023.999	9.145	3145	-0.8	0.02
P082	29.296	-95.731	2016.109	2023.813	7.704	277	1.1	0.18
P083	29.262	-95.182	2016.014	2023.854	7.841	241	-1.8	0.01
P084	29.297	-95.370	2016.052	2022.698	6.646	304	3.7	0.90
P085	29.343	-95.278	2016.033	2023.871	7.838	271	0.6	-0.03
P087	29.058	-95.677	2016.090	2023.931	7.840	264	-1.0	-0.06
P088	29.446	-95.438	2016.131	2023.846	7.715	261	-3.3	-0.45
P089	29.566	-95.799	2015.766	2023.756	7.989	338	-0.5	0.04
P090	29.710	-95.160	2015.975	2023.988	8.014	500	1.8	0.09
P091	29.783	-95.493	2016.320	2023.887	7.567	486	-4.0	0.12
P092	29.881	-95.501	2016.320	2023.887	7.567	454	-5.4	-0.28
P093	29.417	-95.197	2017.238	2023.909	6.671	355	-0.7	0.48
P094	29.722	-95.524	2017.298	2023.928	6.630	417	-3.0	-0.10
P095	29.808	-95.294	2017.200	2023.964	6.764	438	-0.7	0.10
P096	29.724	-95.748	2017.553	2023.999	6.446	2191	-3.0	-1.33
P097	29.785	-95.847	2018.104	2023.638	5.534	341	-9.4	-1.56
P098	29.803	-95.820	2018.120	2023.999	5.879	341	-8.7	-1.77
P099	29.986	-95.579	2018.140	2023.873	5.734	330	-1.9	-0.68
PWES	30.199	-95.511	2015.220	2024.033	8.813	3031	-11.5	-1.31
RDCT	29.810	-95.495	2013.563	2023.655	10.092	3345	-3.3	-0.21
ROD1	30.072	-95.527	2007.003	2024.071	17.068	5910	-21.0	-1.08
RPFB	29.484	-95.514	2014.773	2023.658	8.884	3145	-1.0	-0.01
SANJ	30.507	-95.289	2022.419	2023.964	1.545	379	-1.2	n/a

Site Name	Latitude (Decimal degrees)	Longitude (Decimal degrees)	Start of POR (Decimal year)	End of POR (Decimal Year)	Length of POR (Years)	Number of Samples (Days)	Total Vertical Displacement over POR (cm)	Annual Rate of Change in Ellipsoidal Height 2018-2022 (cm/yr.)
SESG	29.987	-95.430	2014.678	2023.666	8.988	3152	-8.7	-0.94
SHSG	30.054	-95.430	2014.721	2023.658	8.936	3163	-11.1	-1.42
SISD	29.762	-96.174	2015.176	2023.116	7.940	2810	-0.6	0.04
SPBH	29.802	-95.515	2013.303	2023.655	10.352	3682	-5.2	-0.29
TDAM	29.314	-94.817	2013.435	2023.658	10.223	3364	-2.0	0.06
THSU	29.714	-95.340	2012.953	2023.658	10.705	3514	0.8	0.22
TMCC	29.702	-95.395	2003.271	2023.835	20.564	5225	-2.5	0.03
TXAC	29.778	-94.671	2011.124	2024.071	12.947	4669	2.2	0.55
TXAV	29.403	-95.242	2017.147	2023.526	6.379	1853	-1.0	-0.10
TXB1	30.161	-94.181	2013.191	2024.071	10.880	3653	1.0	0.27
TXB2	30.090	-94.192	2012.463	2023.529	11.066	3691	-9.9	-0.15
TXBC	29.000	-95.972	2009.405	2024.071	14.667	5286	-2.7	-0.06
TXBH	29.786	-95.946	2017.150	2023.504	6.354	2244	-2.2	-0.32
TXC5	29.704	-96.573	2017.213	2023.526	6.313	2261	0.0	0.04
TXCF	29.704	-96.573	2017.065	2023.381	6.316	2242	0.4	0.03
TXCK	31.323	-95.436	2012.022	2024.071	12.049	4328	1.1	0.15
TXCM	29.703	-96.577	2010.437	2024.071	13.635	4938	-0.3	0.08
TXCN	30.349	-95.441	2005.580	2024.071	18.491	6721	-19.9	-0.78
TXCY	30.096	-95.626	2017.391	2023.526	6.136	2072	-6.6	-1.08
TXED	28.968	-96.634	2009.429	2024.071	14.642	3701	-0.2	0.05
TXEX	29.564	-95.119	2010.881	2023.999	13.118	4278	3.4	0.24
TXGA	29.328	-94.773	2005.580	2024.071	18.491	6542	-3.6	-0.12
TXGN	31.061	-95.136	2012.022	2024.027	12.005	4043	0.7	0.27
TXH1	30.893	-96.602	2013.191	2024.071	10.880	3649	-0.1	0.19
TXH2	29.563	-94.391	2016.090	2023.504	7.414	2386	1.5	0.24
TXHE	30.099	-96.063	2005.580	2024.071	18.491	6719	-5.3	0.08
TXHP	31.334	-93.865	2012.022	2024.071	12.049	4331	4.7	0.46
TXKO	30.395	-94.332	2011.770	2024.071	12.301	4442	-0.0	0.16
TXLF	31.356	-94.718	2005.580	2024.071	18.491	6712	1.0	0.08
TXLI	30.056	-94.771	2005.580	2024.071	18.491	6673	1.1	0.13
TXLM	29.392	-95.024	2005.580	2024.071	18.491	6710	-5.6	-0.39
TXLQ	29.358	-94.953	2013.059	2023.526	10.467	3678	1.3	0.19
TXLV	30.745	-94.922	2011.778	2024.071	12.293	4460	-0.9	0.00
TXMD	30.960	-95.915	2010.584	2024.071	13.487	4581	1.7	0.18
TXMG	28.983	-95.964	2013.309	2023.526	10.218	3334	-1.6	-0.05
TXNE	30.848	-93.775	2013.191	2024.071	10.880	3557	-0.6	0.14
TXNV	30.382	-96.067	2012.463	2023.529	11.066	3949	-2.3	0.03
TXP5	29.668	-95.042	2019.181	2023.526	4.345	1448	1.7	0.25
TXPV	28.638	-96.619	2010.292	2024.071	13.780	4998	0.2	0.00
TXRN	29.543	-95.829	2015.206	2023.526	8.320	2992	-0.6	0.04
TXSP	29.731	-93.897	2016.454	2023.526	7.072	2304	1.2	0.28
TXTG	29.898	-95.297	2015.466	2023.529	8.063	2873	-1.8	-0.11
TXVA	28.835	-96.910	2005.092	2024.071	18.979	6751	1.5	-0.03
TXVC	28.834	-96.958	2015.310	2023.526	8.216	2955	1.1	0.31
TXWH	29.325	-96.112	2010.426	2024.071	13.646	4924	-1.3	0.37
TXWI	29.806	-94.371	2015.480	2023.529	8.049	2742	-0.4	0.09
TXWN	29.329	-96.092	2015.003	2023.526	8.523	3052	0.2	0.06
TXWO	30.782	-94.424	2013.191	2024.071	10.880	3432	-0.9	0.11

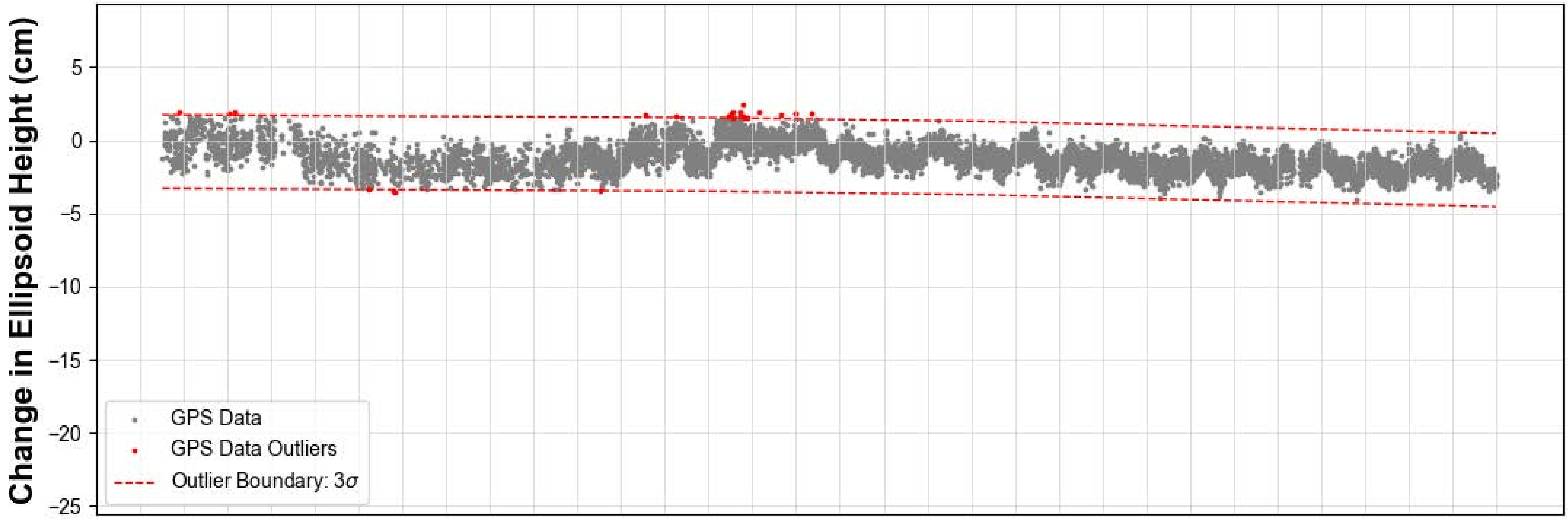
Site Name	Latitude (Decimal degrees)	Longitude (Decimal degrees)	Start of POR (Decimal year)	End of POR (Decimal Year)	Length of POR (Years)	Number of Samples (Days)	Total Vertical Displacement over POR (cm)	Annual Rate of Change in Ellipsoidal Height 2018-2022 (cm/yr.)
UH02	30.315	-95.457	2015.003	2023.381	8.378	2879	-5.0	-0.80
UHC1	29.390	-95.044	2014.137	2023.876	9.739	3453	-2.5	-0.06
UHC2	29.390	-95.044	2014.137	2023.881	9.745	3456	-2.7	-0.08
UHC3	29.390	-95.044	2014.137	2023.881	9.745	3344	-3.7	-0.15
UHC4	29.390	-95.044	2023.884	2024.068	0.184	71	1.8	n/a
UHC5	29.390	-95.044	2023.786	2024.074	0.288	106	0.1	n/a
UHCL	29.578	-95.104	2014.242	2024.033	9.791	3194	0.5	0.20
UHCR	29.728	-95.757	2014.125	2023.140	9.016	3288	-8.3	-0.94
UHEB	29.526	-96.066	2014.595	2023.086	8.490	2800	-0.7	0.00
UHRI	29.719	-95.403	2014.330	2023.888	9.558	3330	-3.4	0.08
WCHT	29.783	-95.581	2013.295	2023.658	10.363	3567	-8.6	-0.46
WEPD	29.688	-95.229	2014.075	2023.658	9.583	3307	2.0	0.29
WHCR	30.194	-95.505	2014.779	2024.019	9.240	3214	-7.3	-0.95
YORS	30.110	-95.469	2020.827	2023.986	3.159	1151	-3.9	-1.29
ZHU1	29.962	-95.331	2003.042	2024.071	21.029	7311	-18.0	-0.61

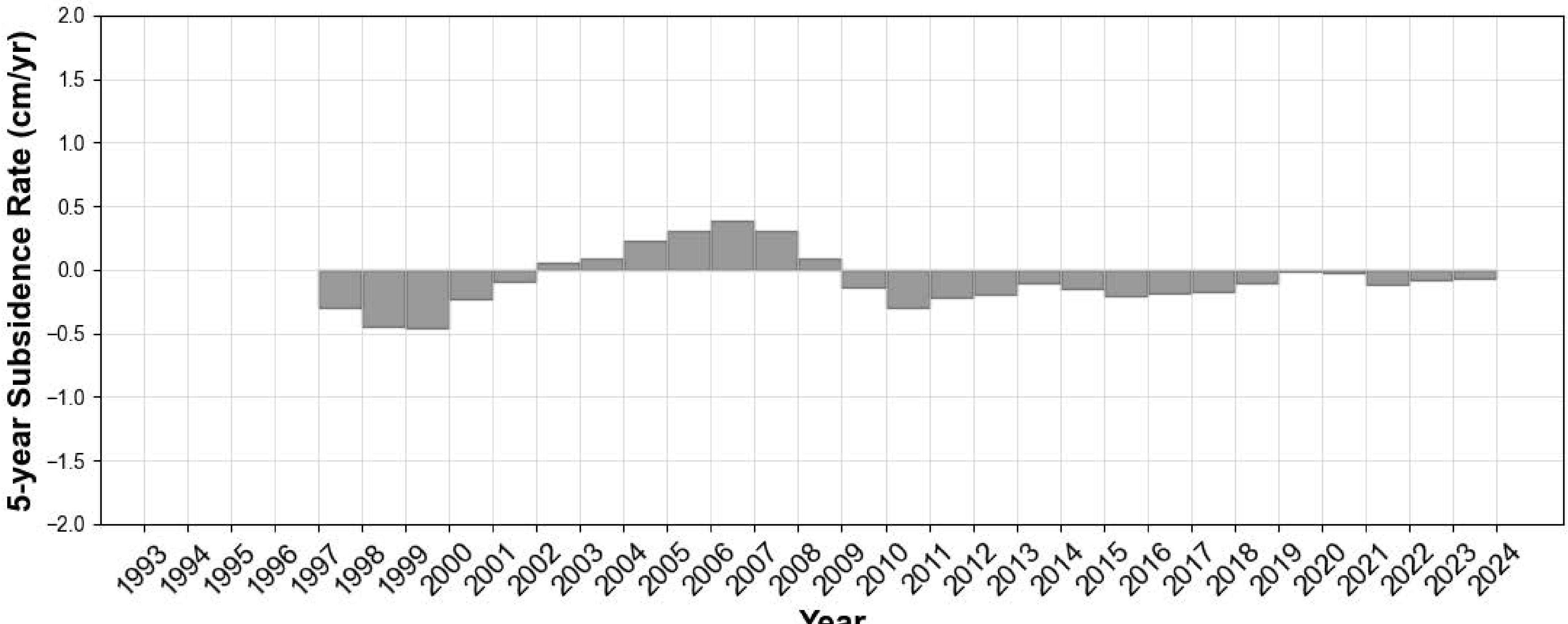
Notes:

n/a: rate of change in ellipsoidal height not calculated.

ADKS

Houston, TX

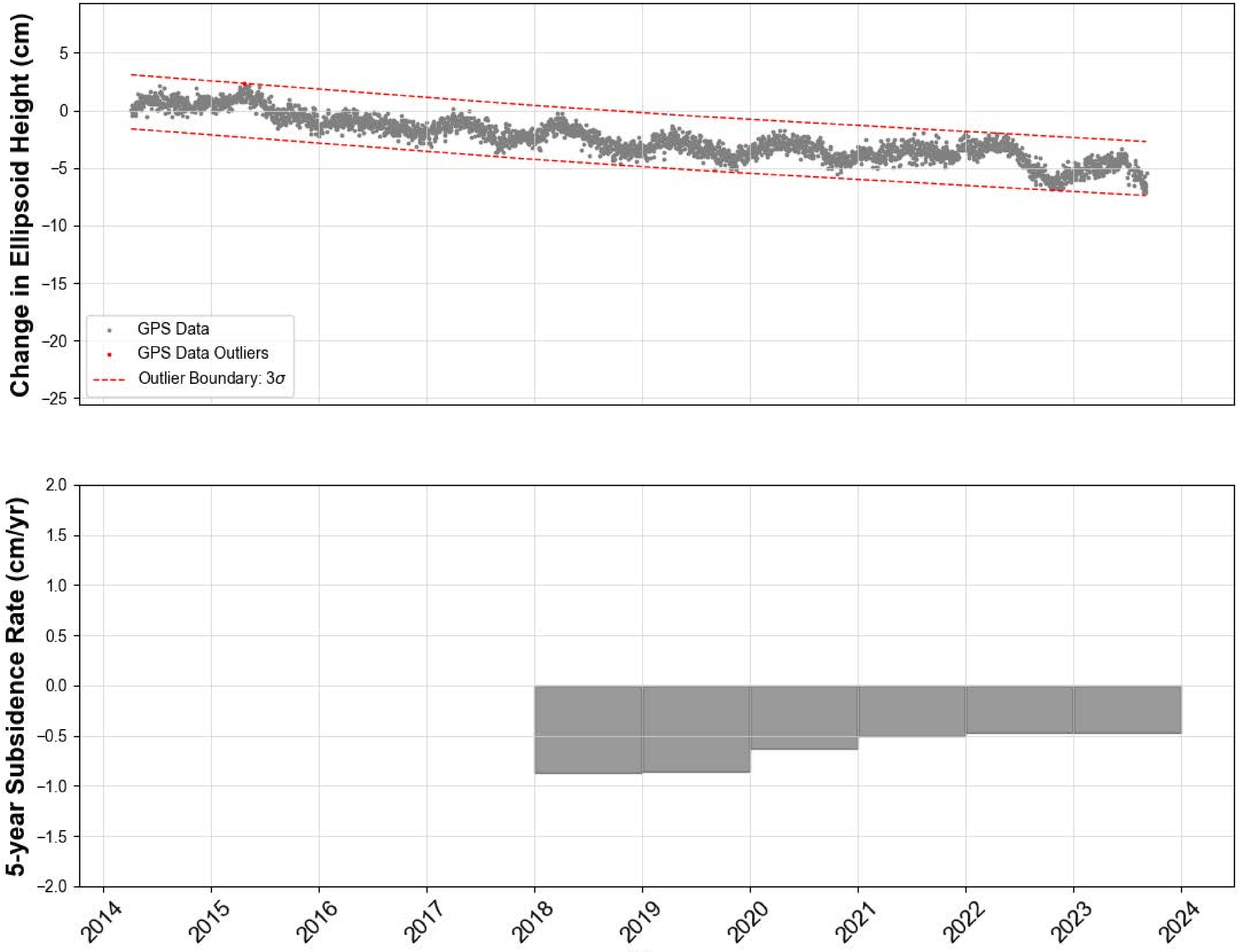




Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

ALEF

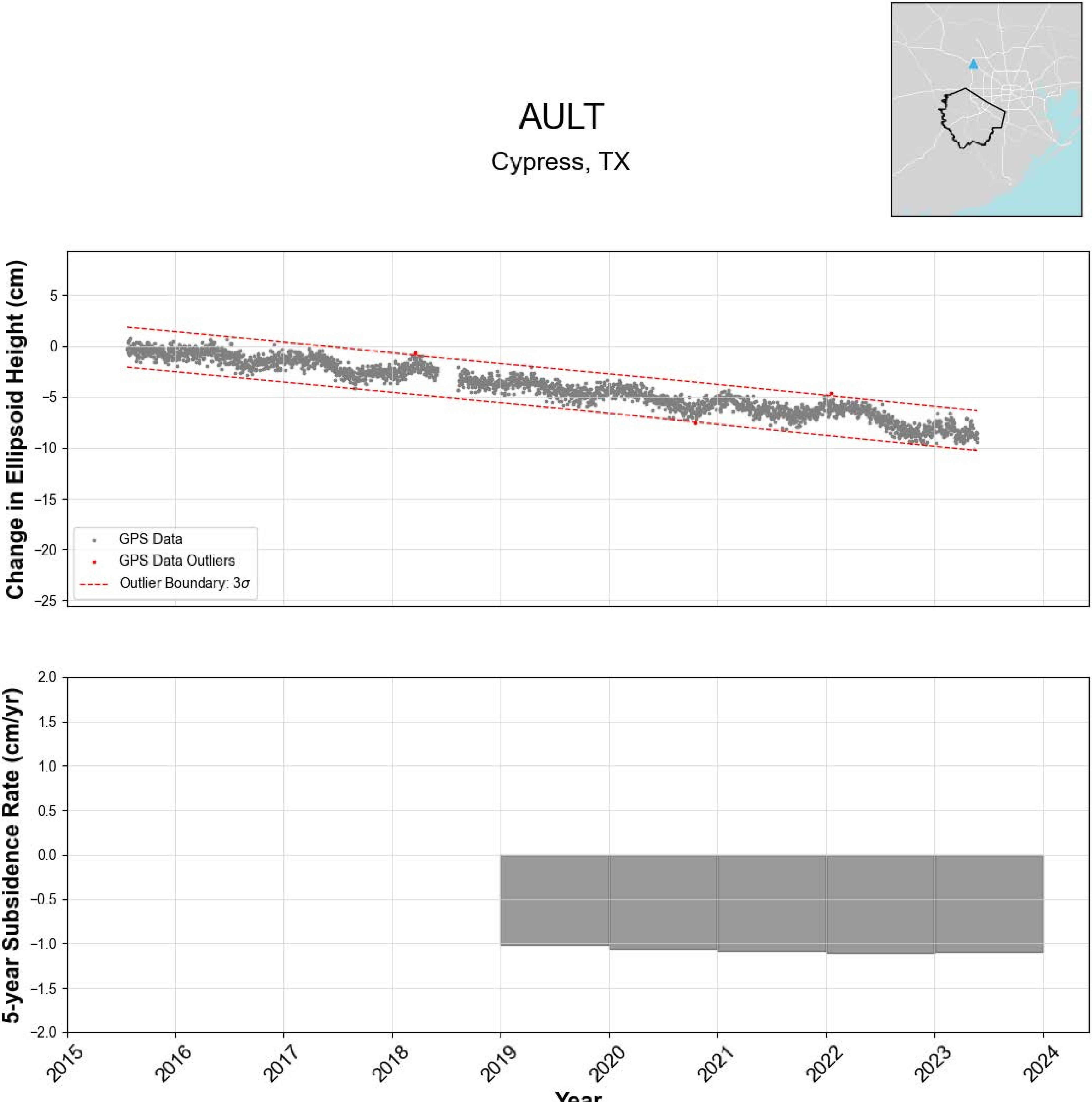
Houston, TX



Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

AULT

Cypress, TX



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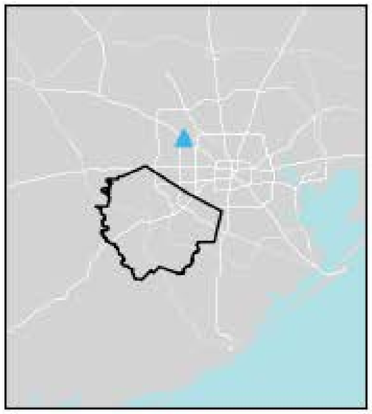
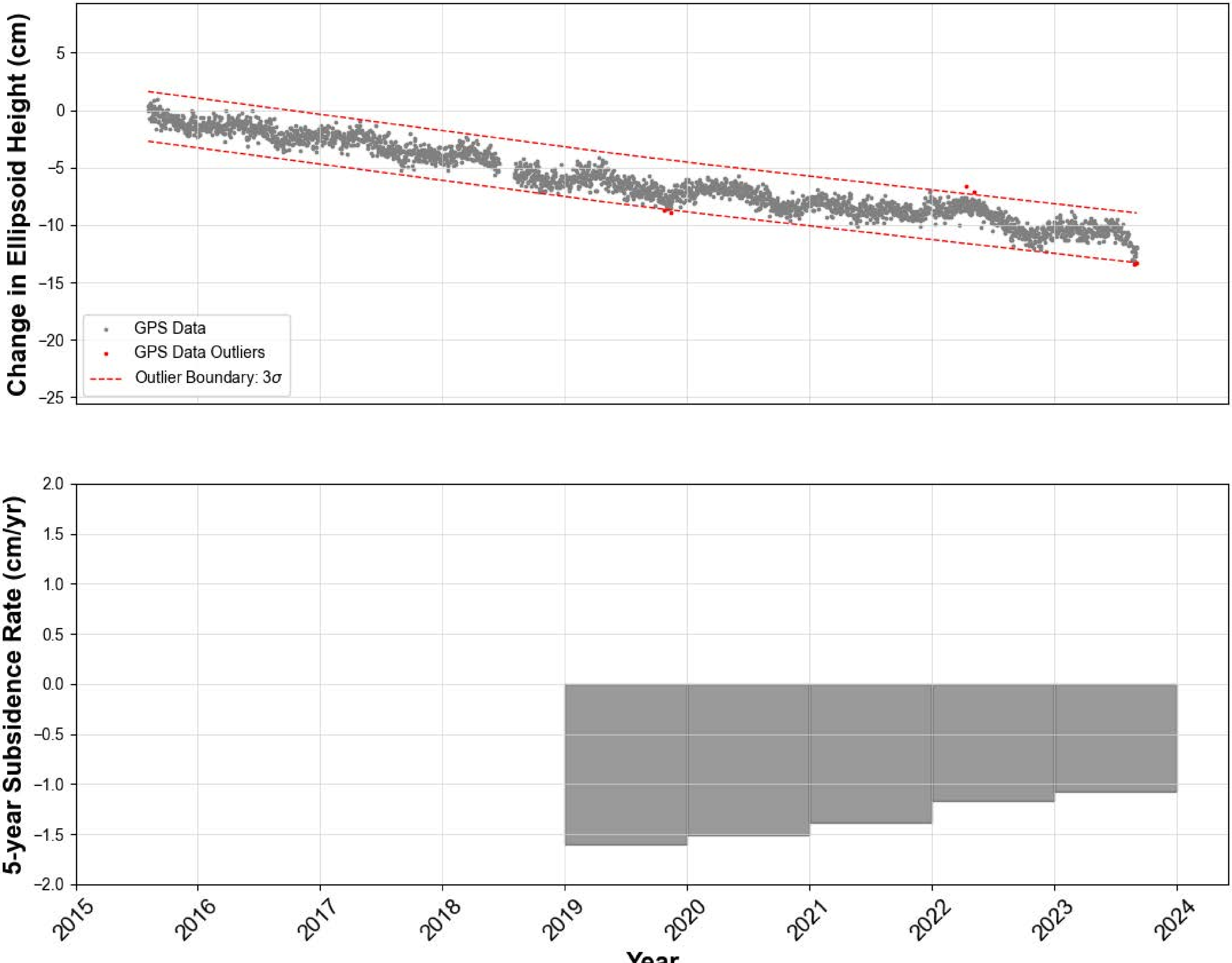
CFHS

Houston, TX

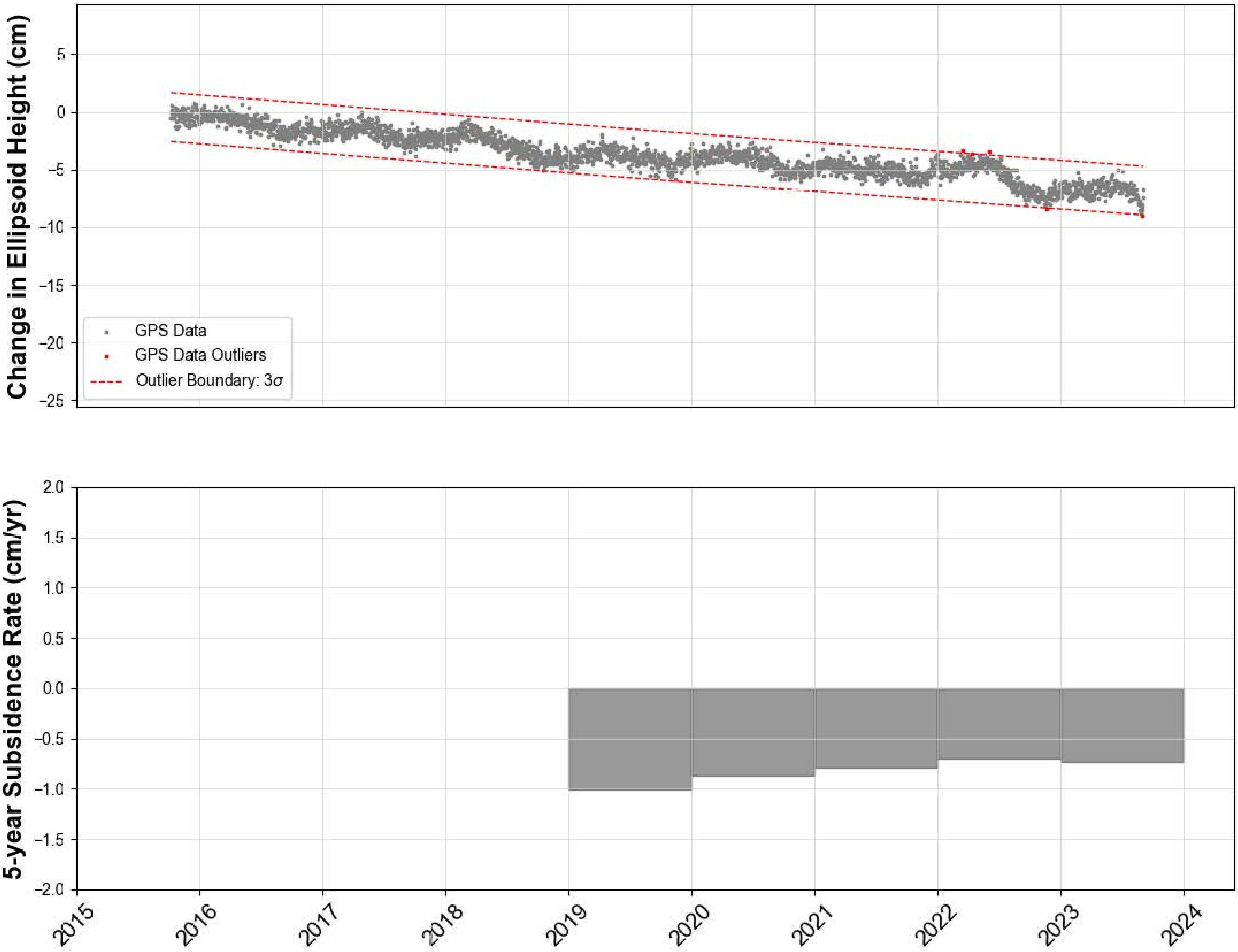




Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

CFJV

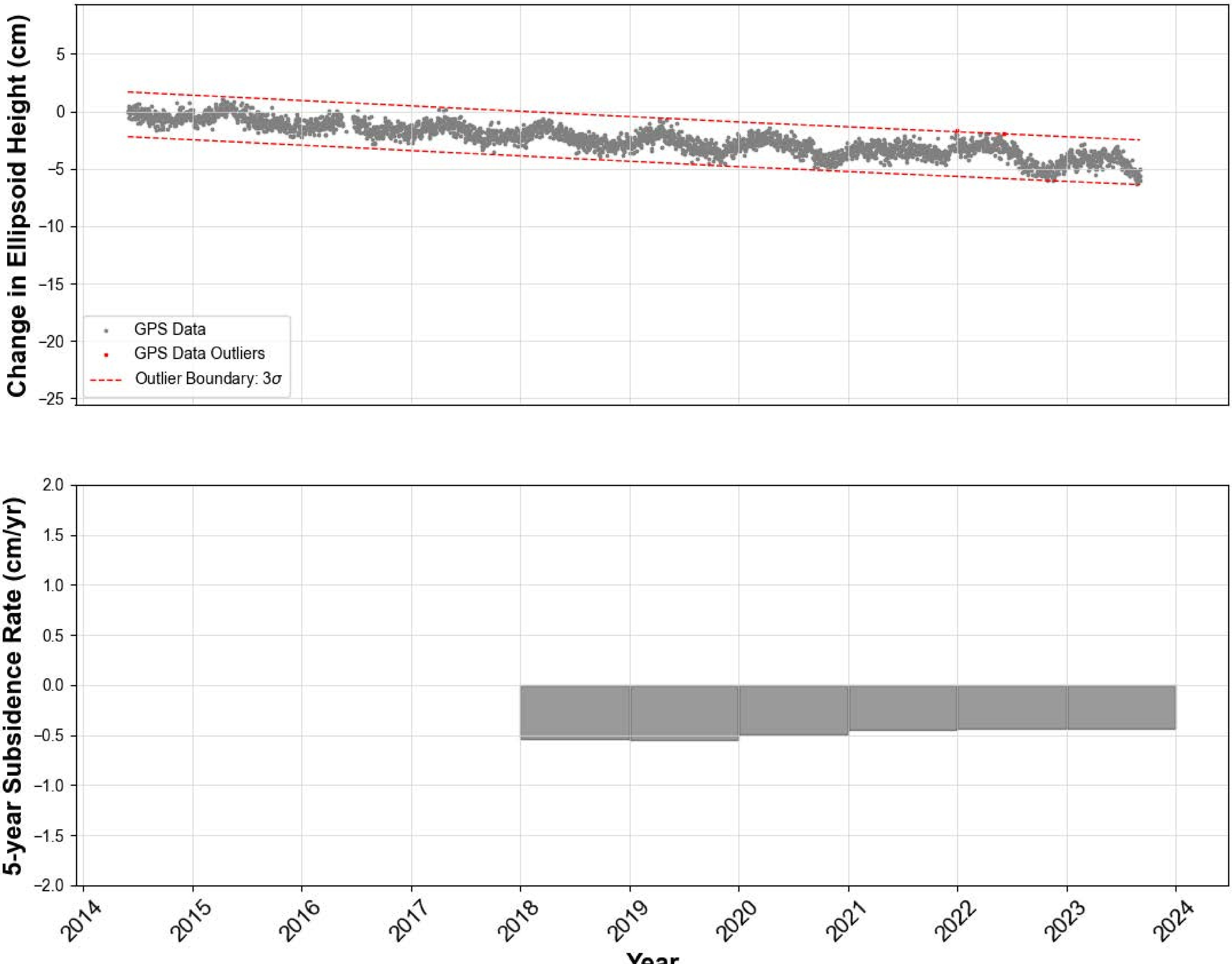
Jersey Village, TX



Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

CMFB

Richmond, TX



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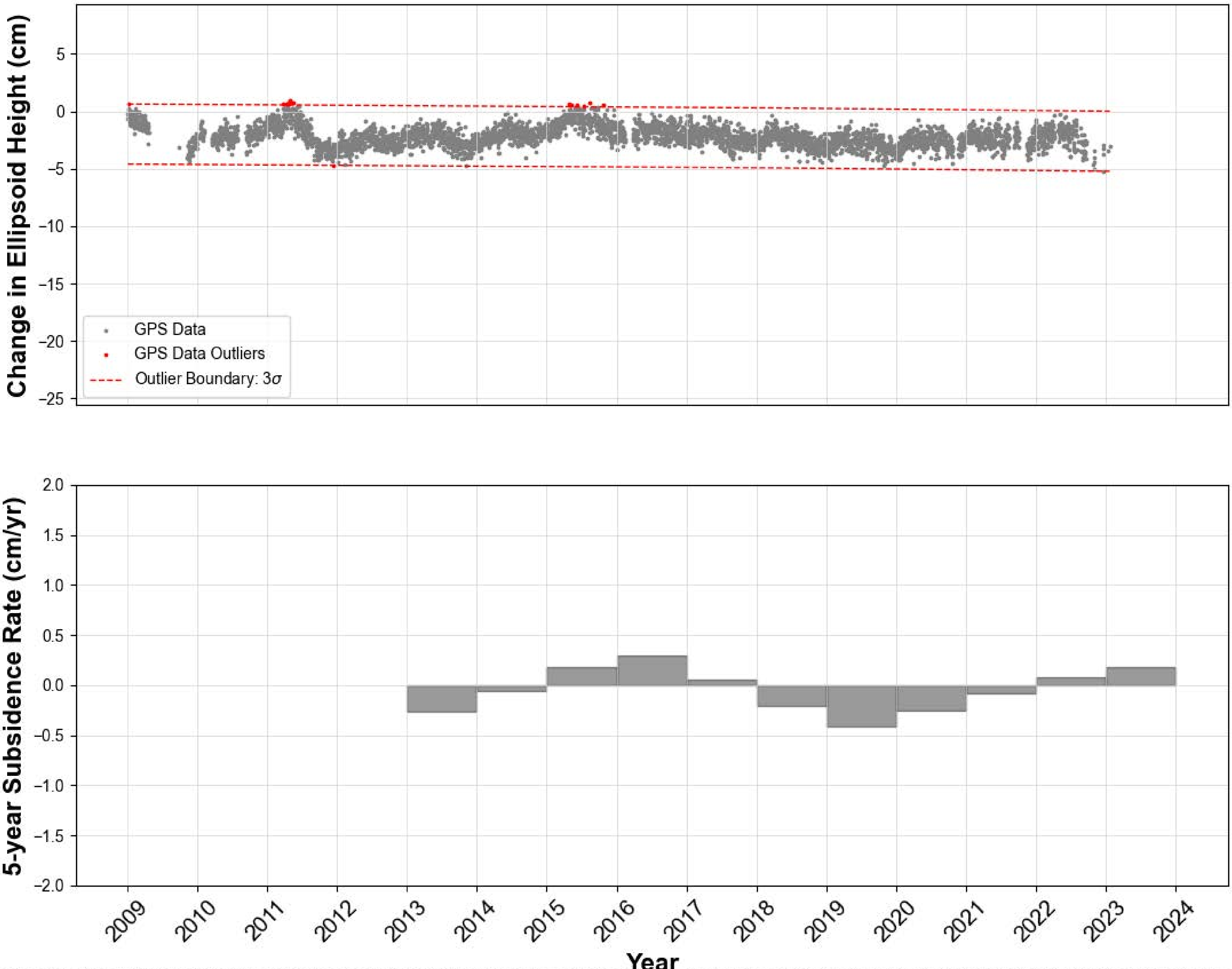
COH2

Houston, TX



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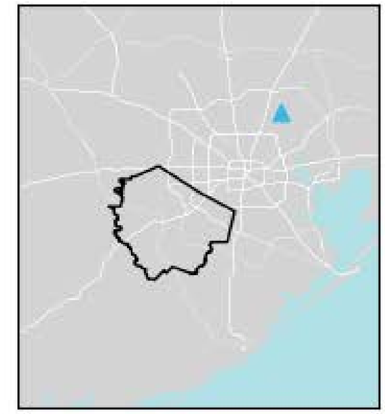
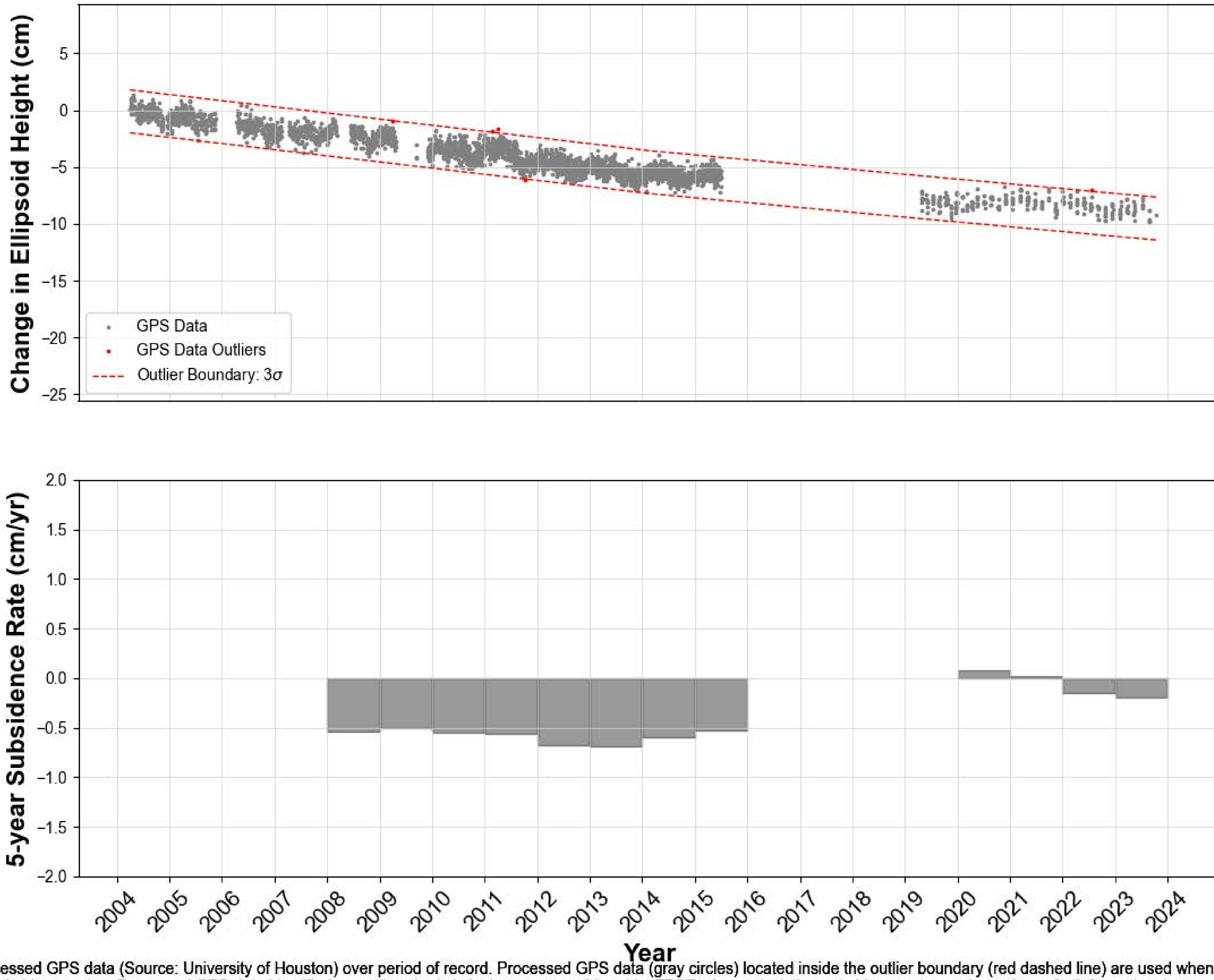


COH6

Humble, TX



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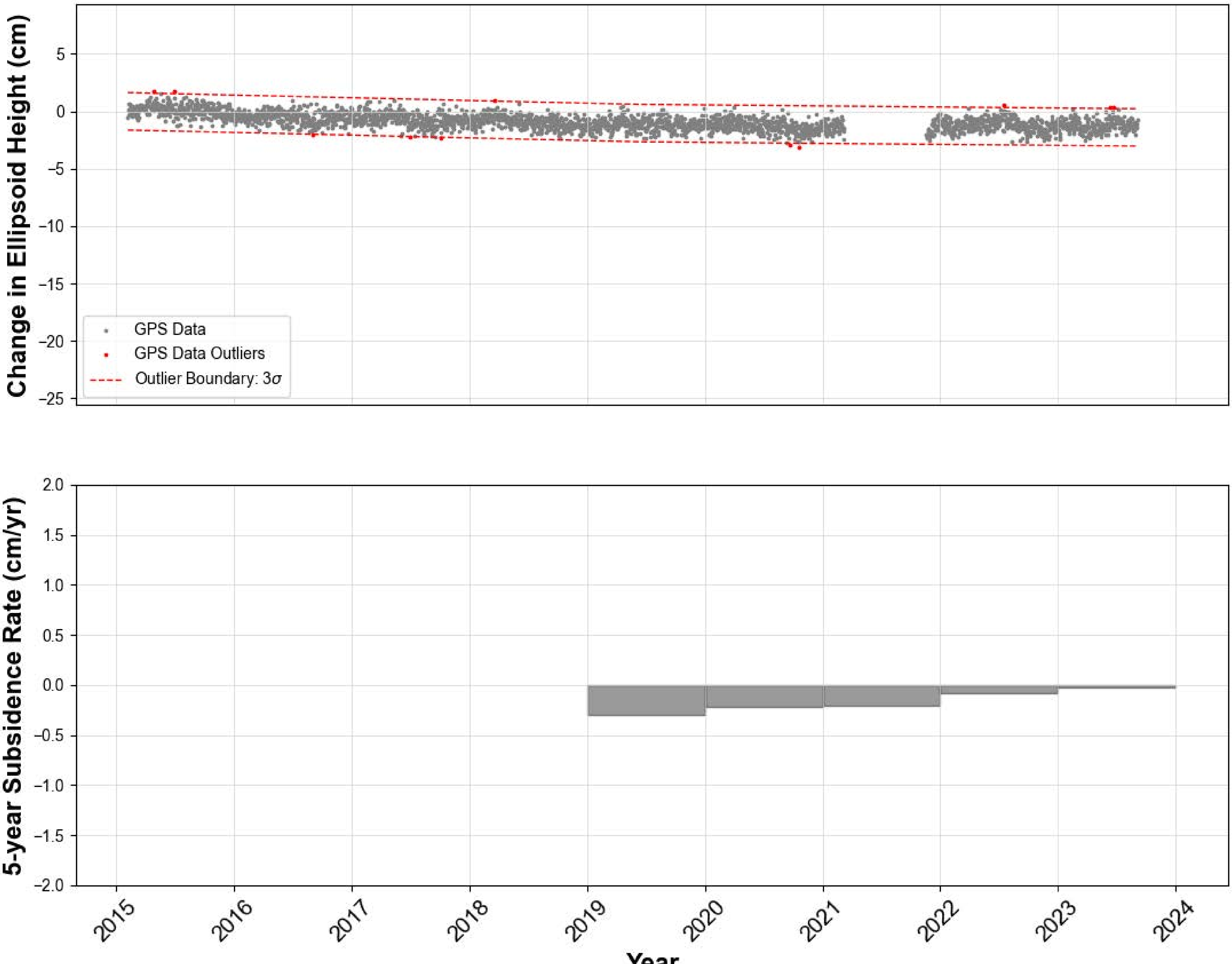
COTM

Texas City, TX



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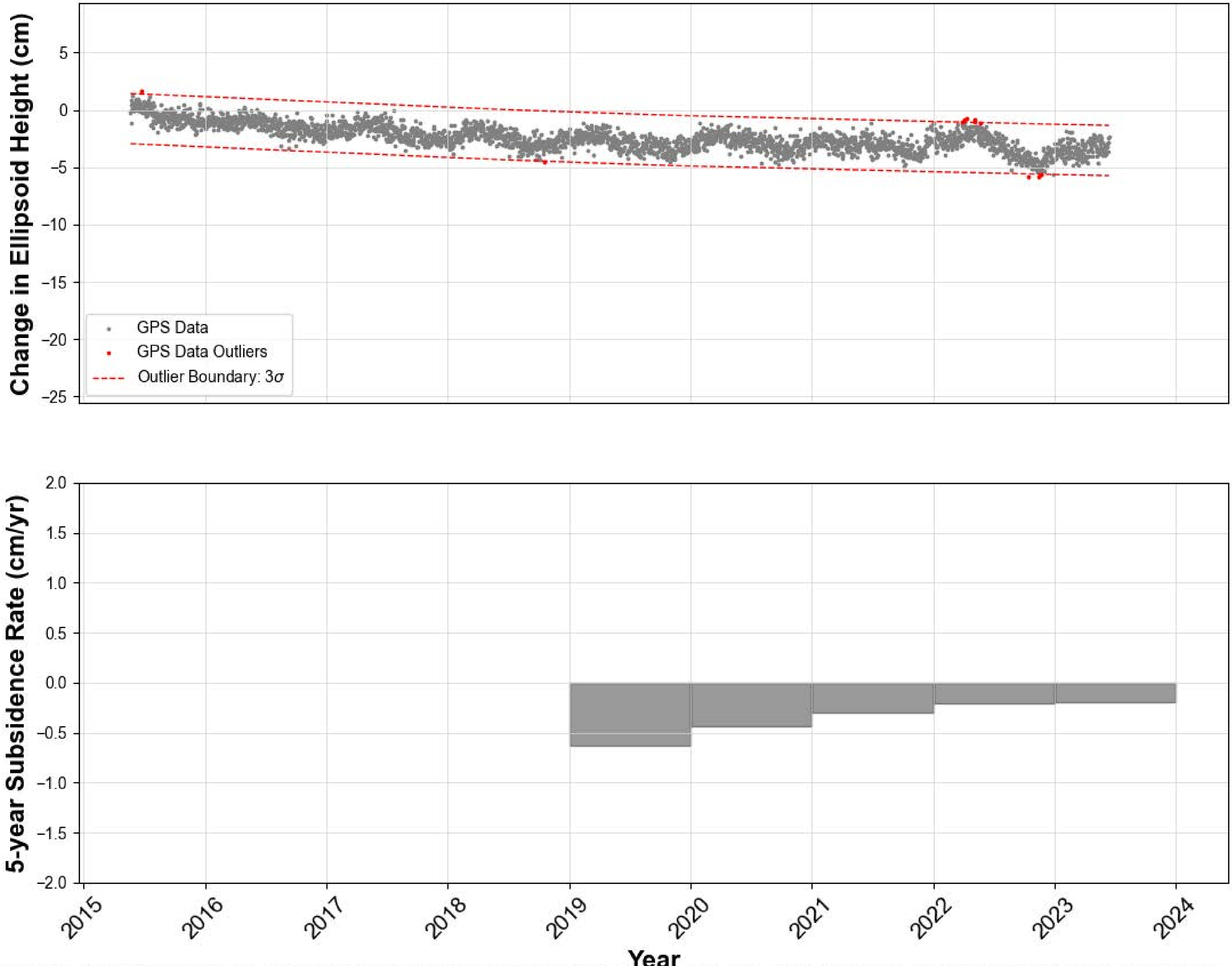
CSTE

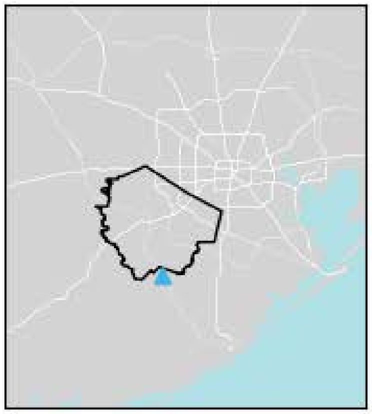
Houston, TX

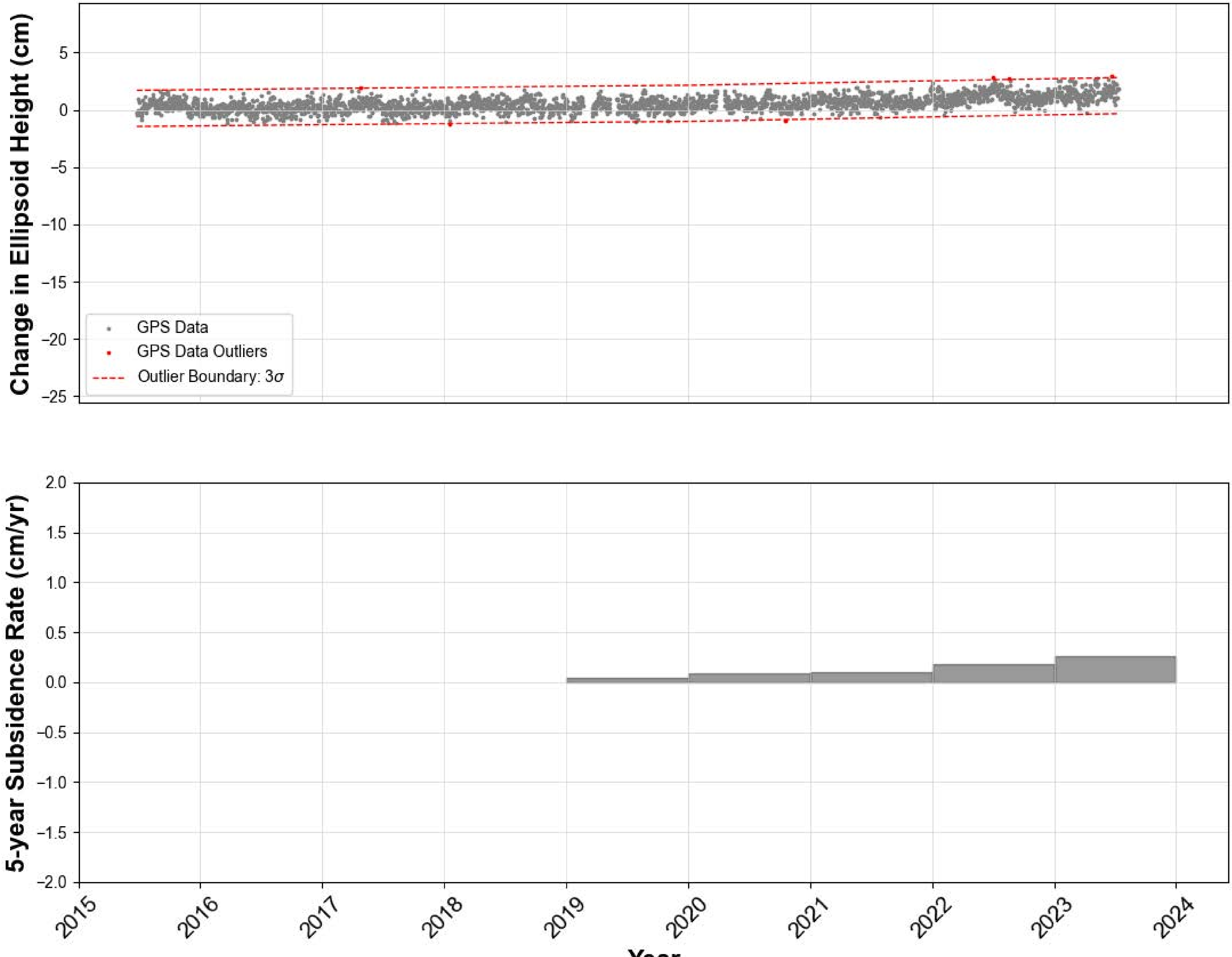


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

DISD

Damon, TX





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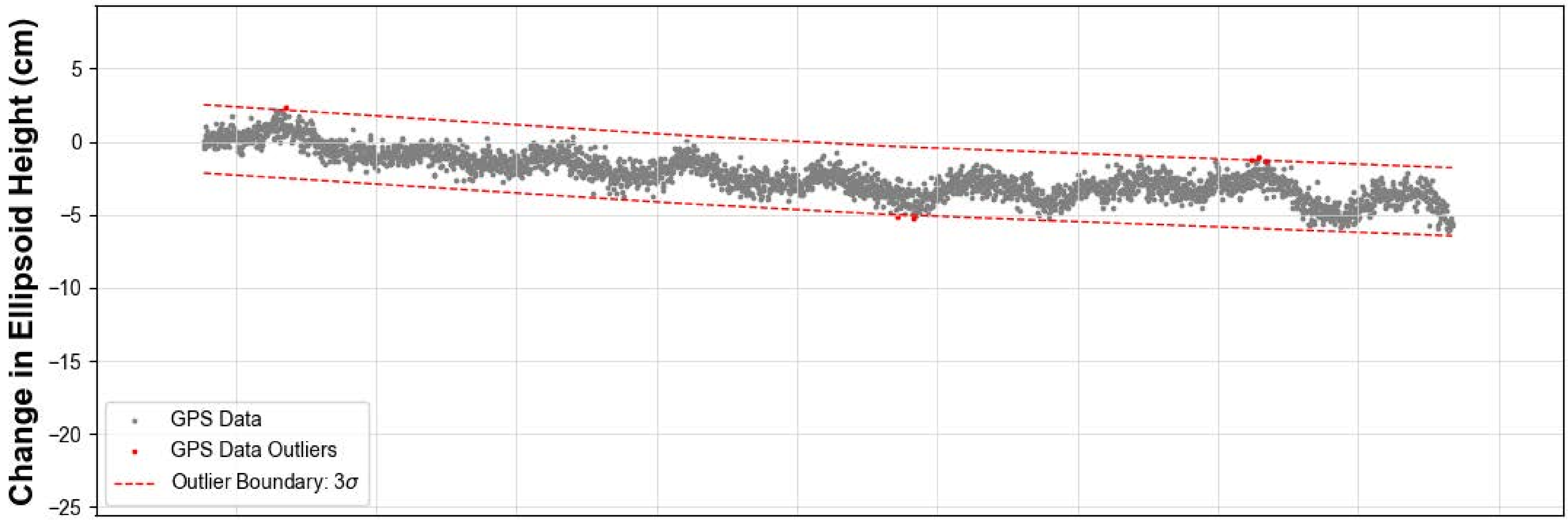
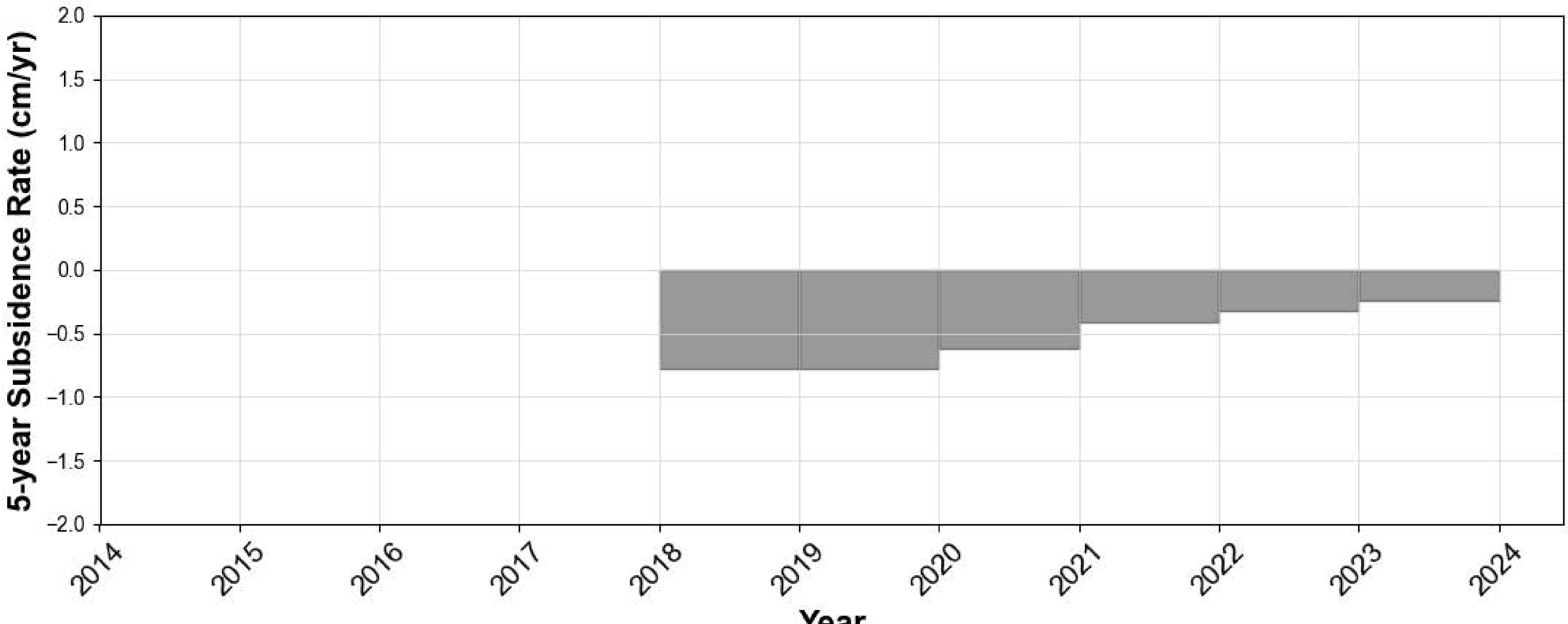
DMFB

Sugar Land, TX

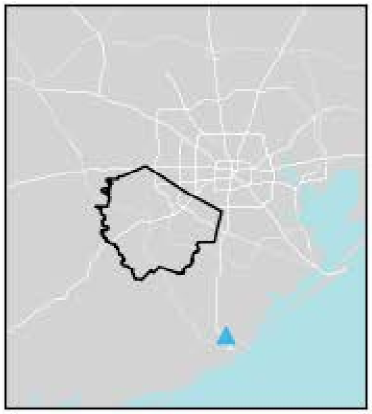


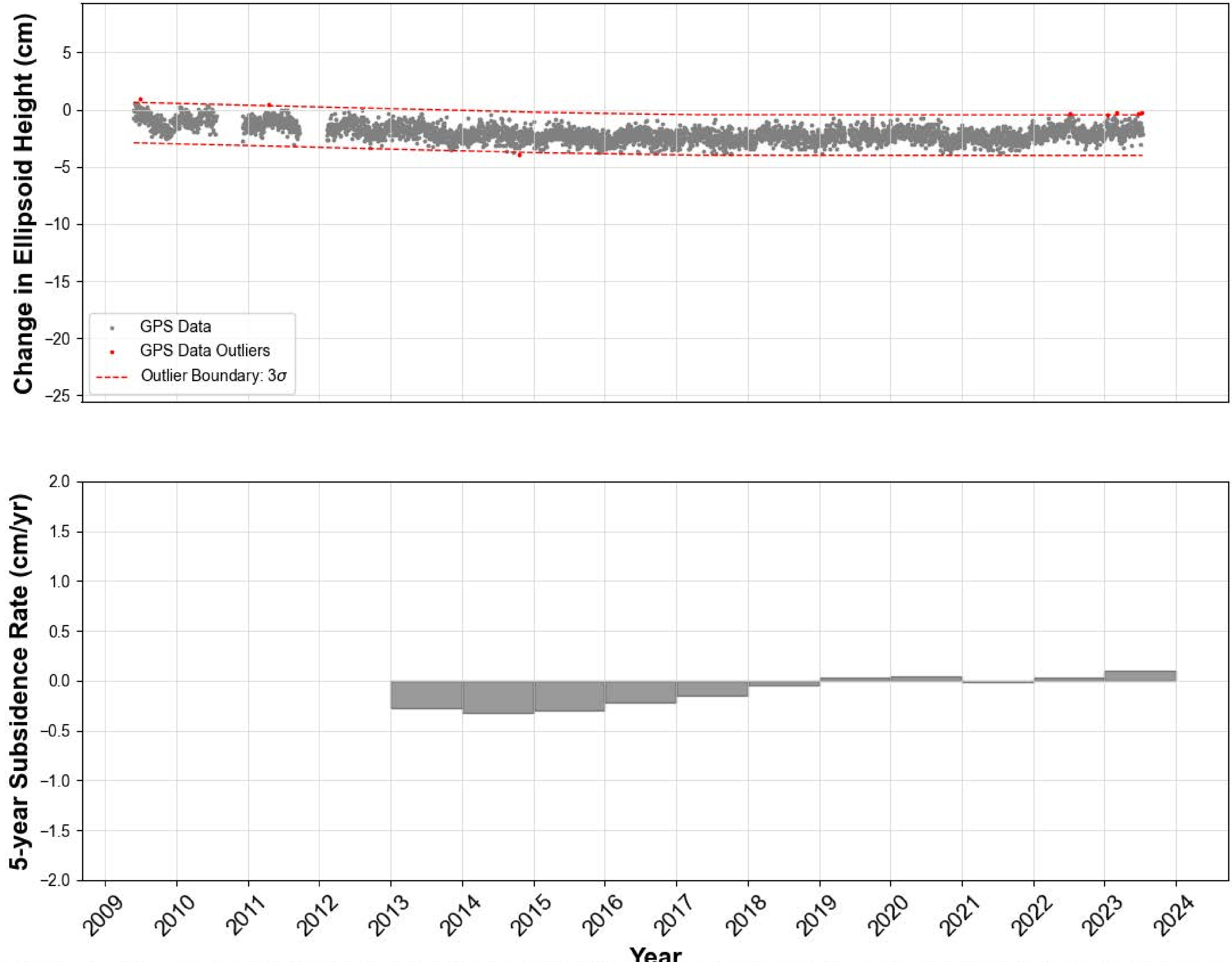


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

DWI1

Clute, TX





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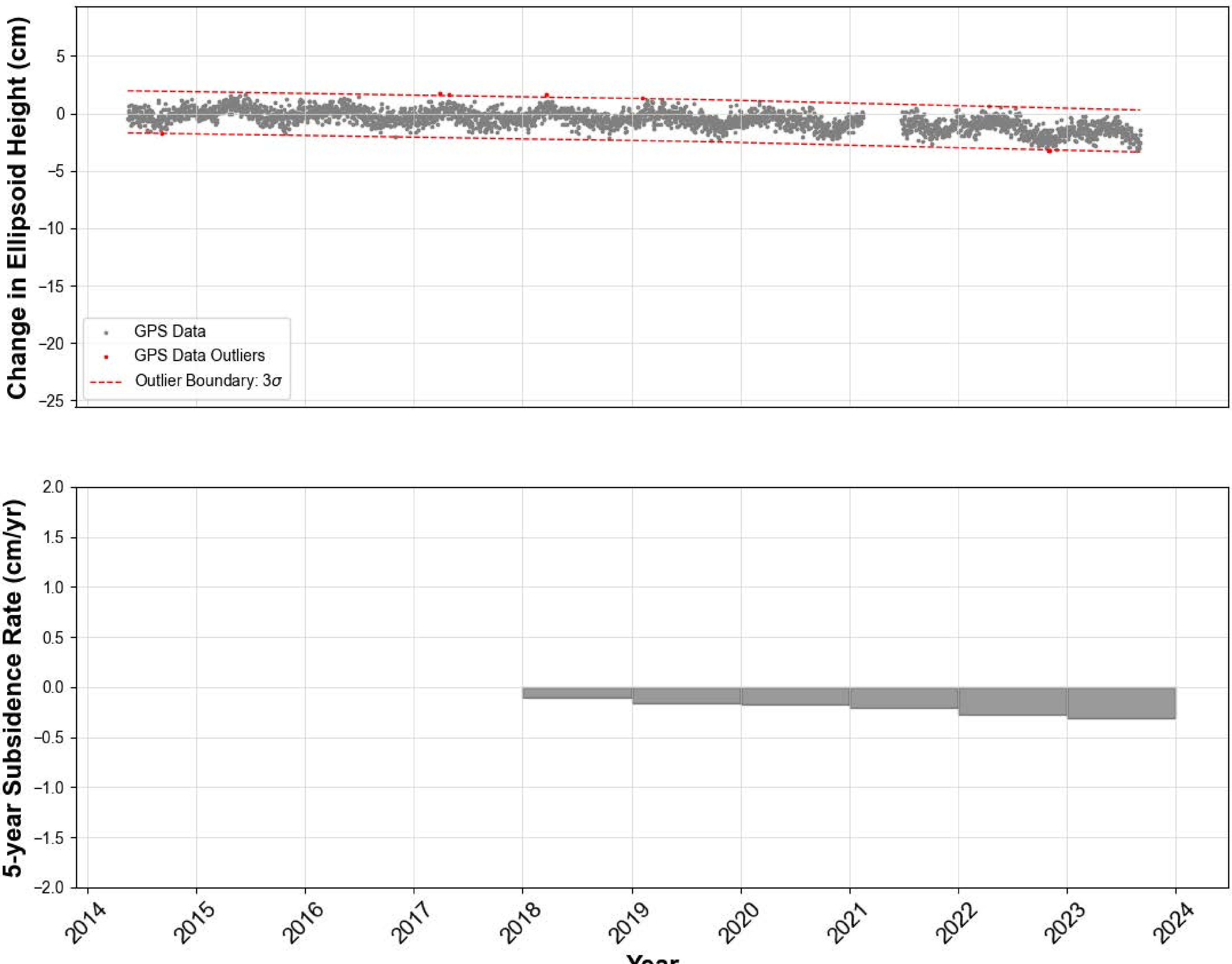
FSFB

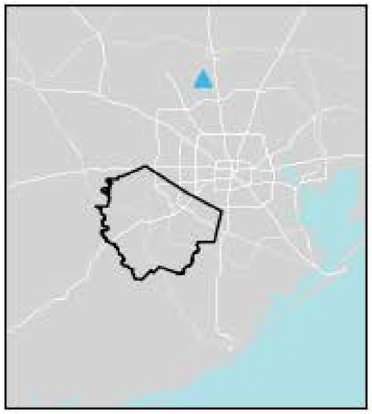
Sugar Land, TX

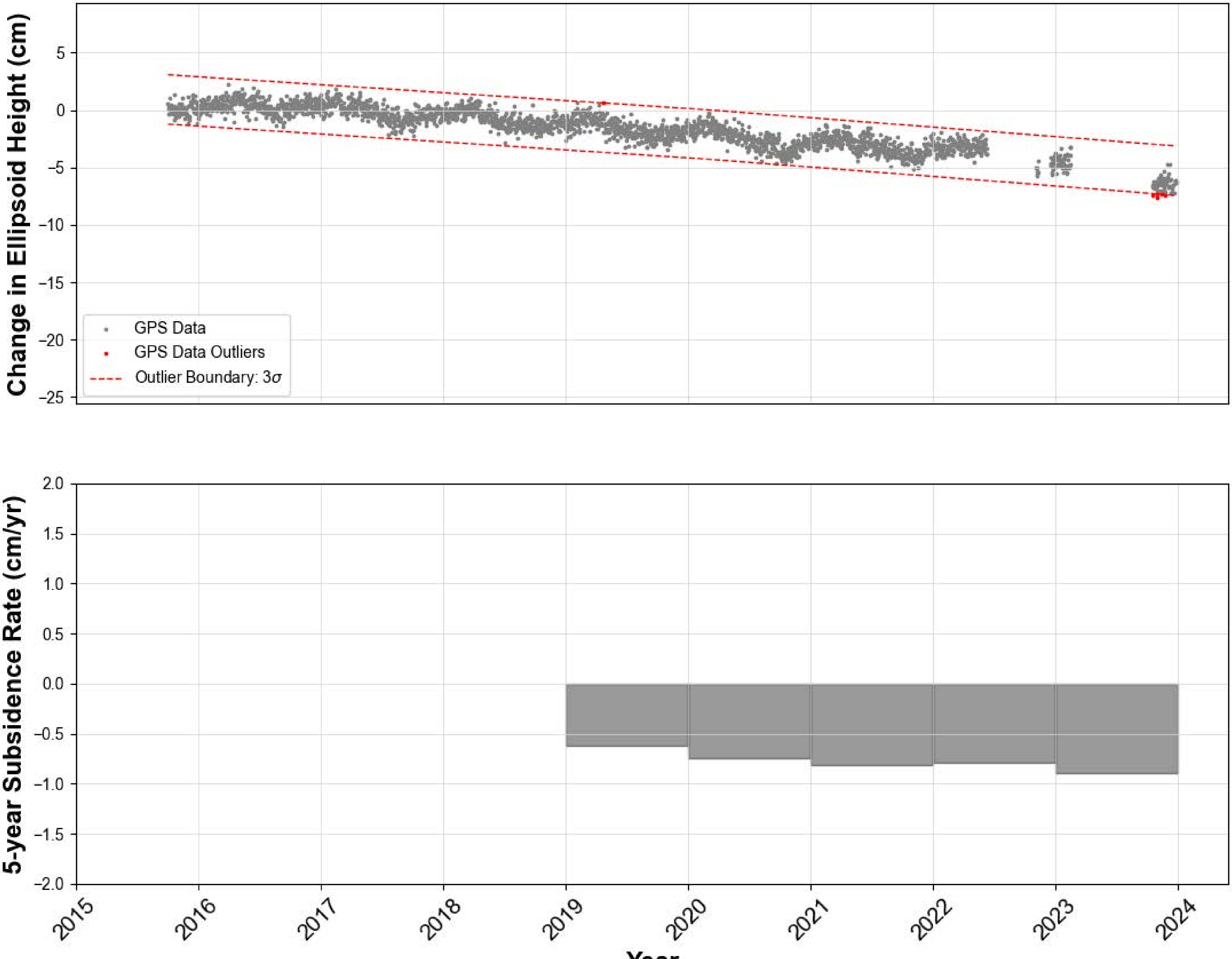


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

GSEC

Spring, TX





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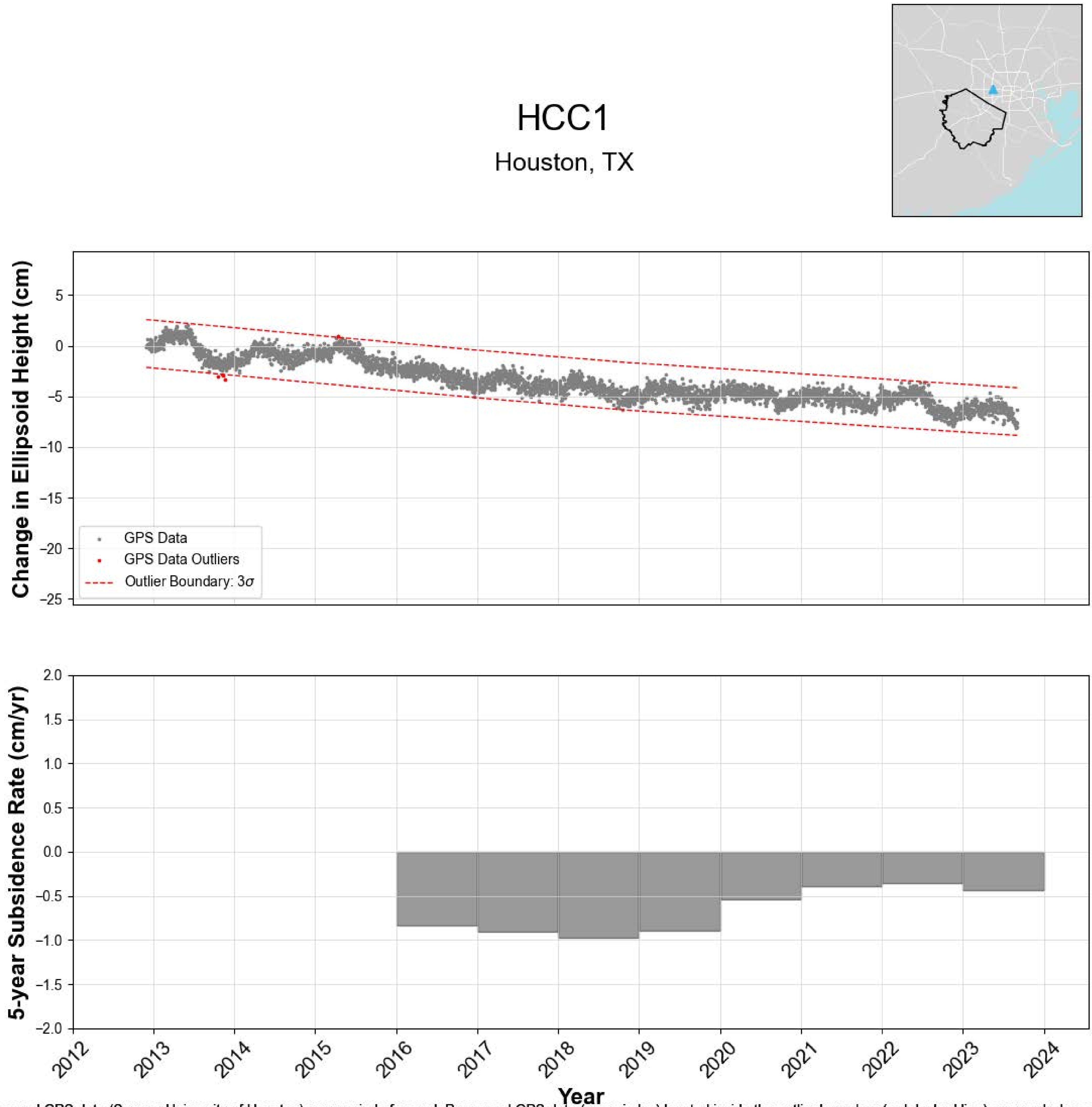

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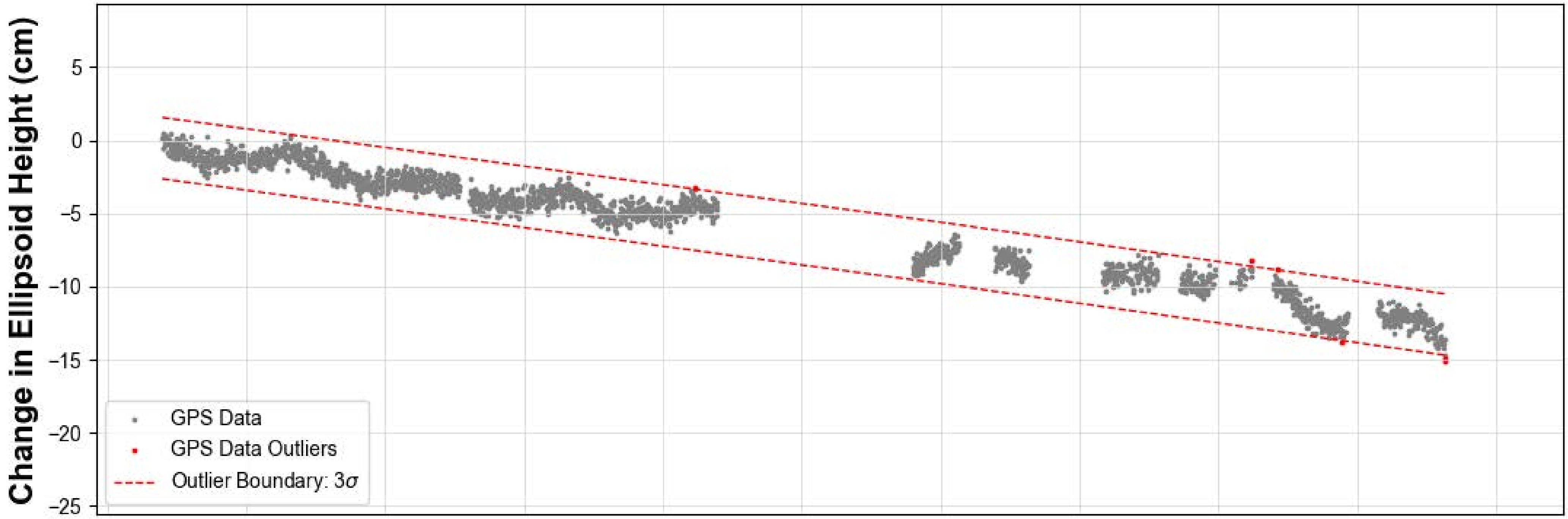
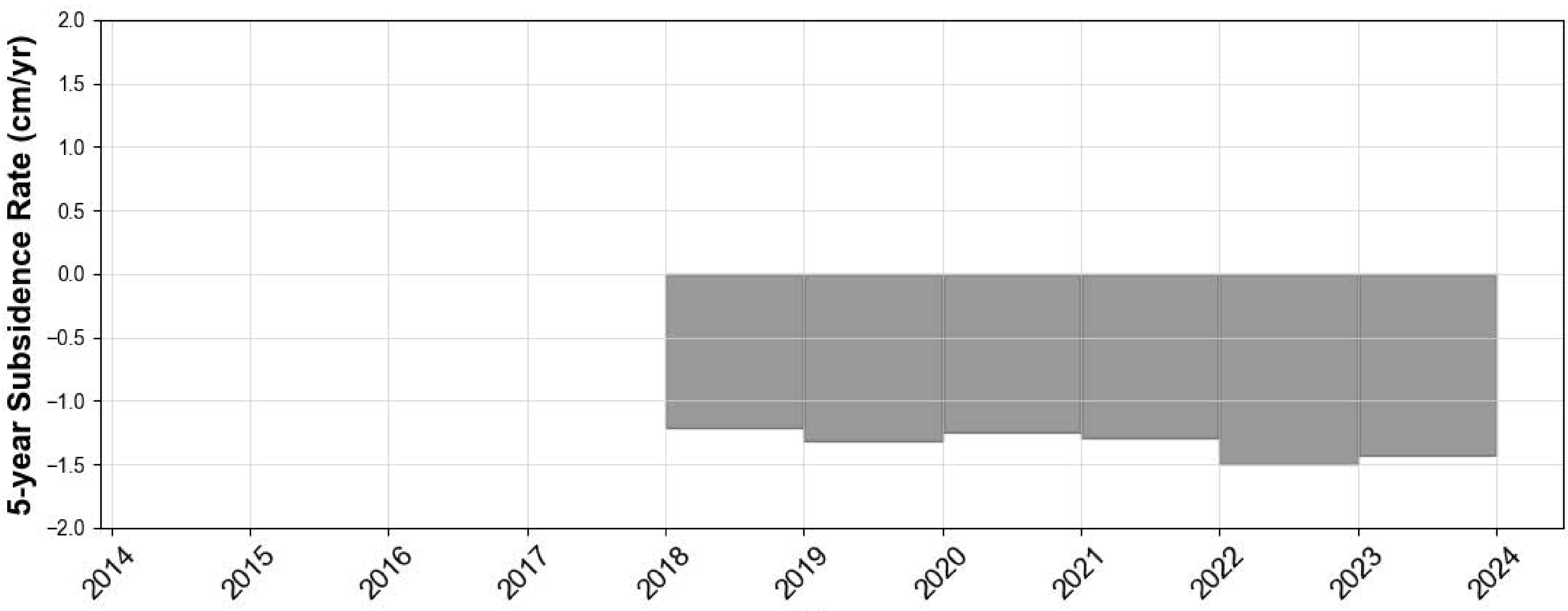
HPEK

Katy, TX





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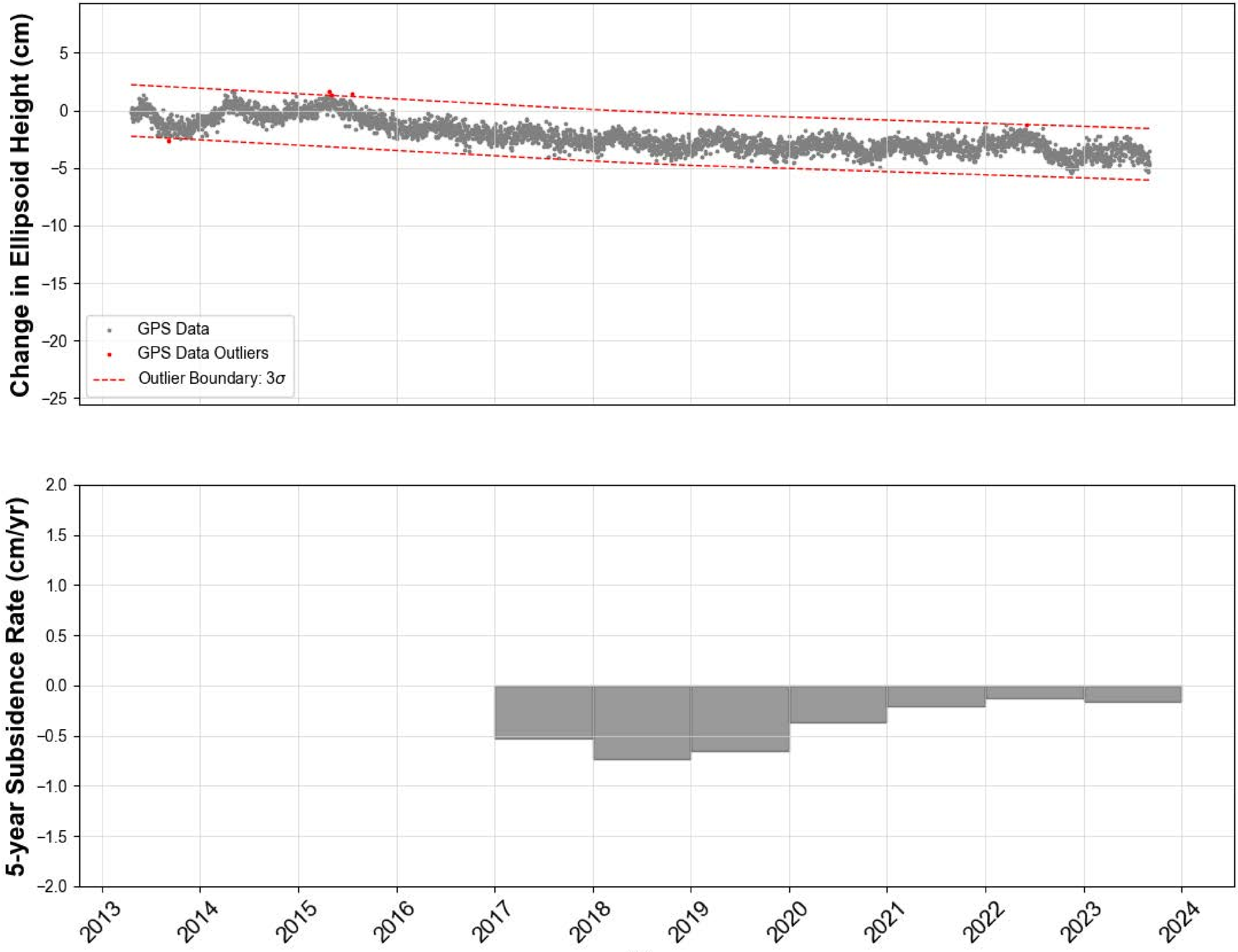
HSMN

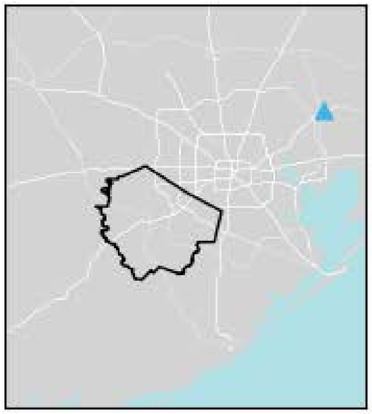
Houston, TX

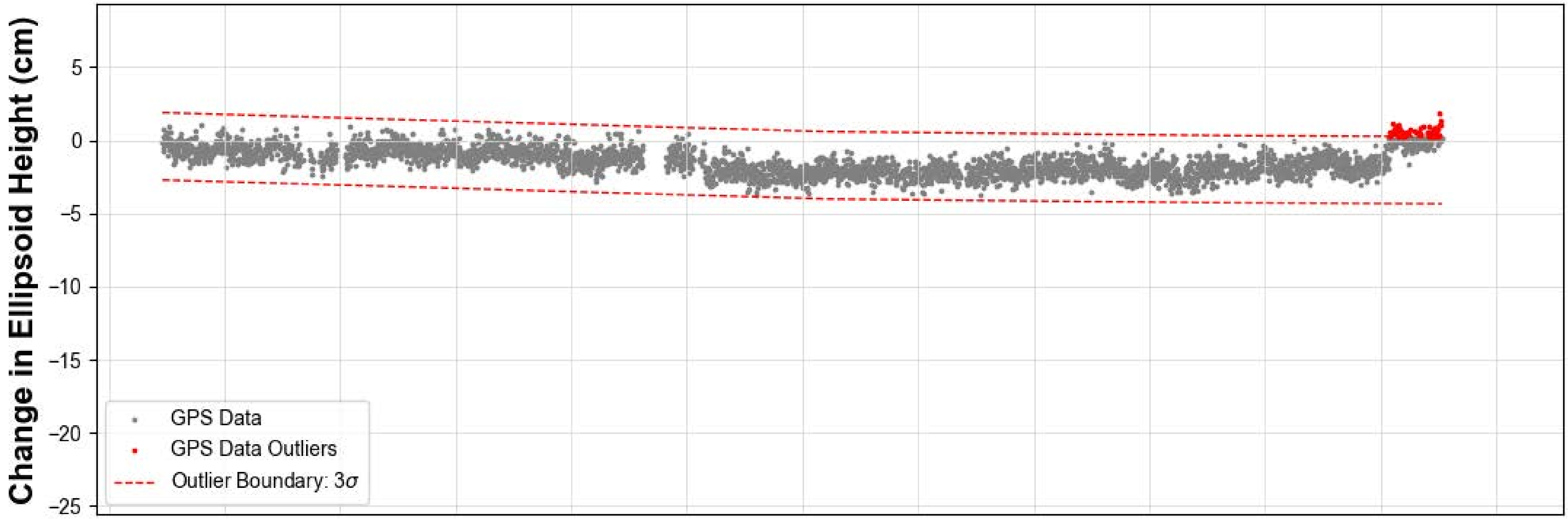


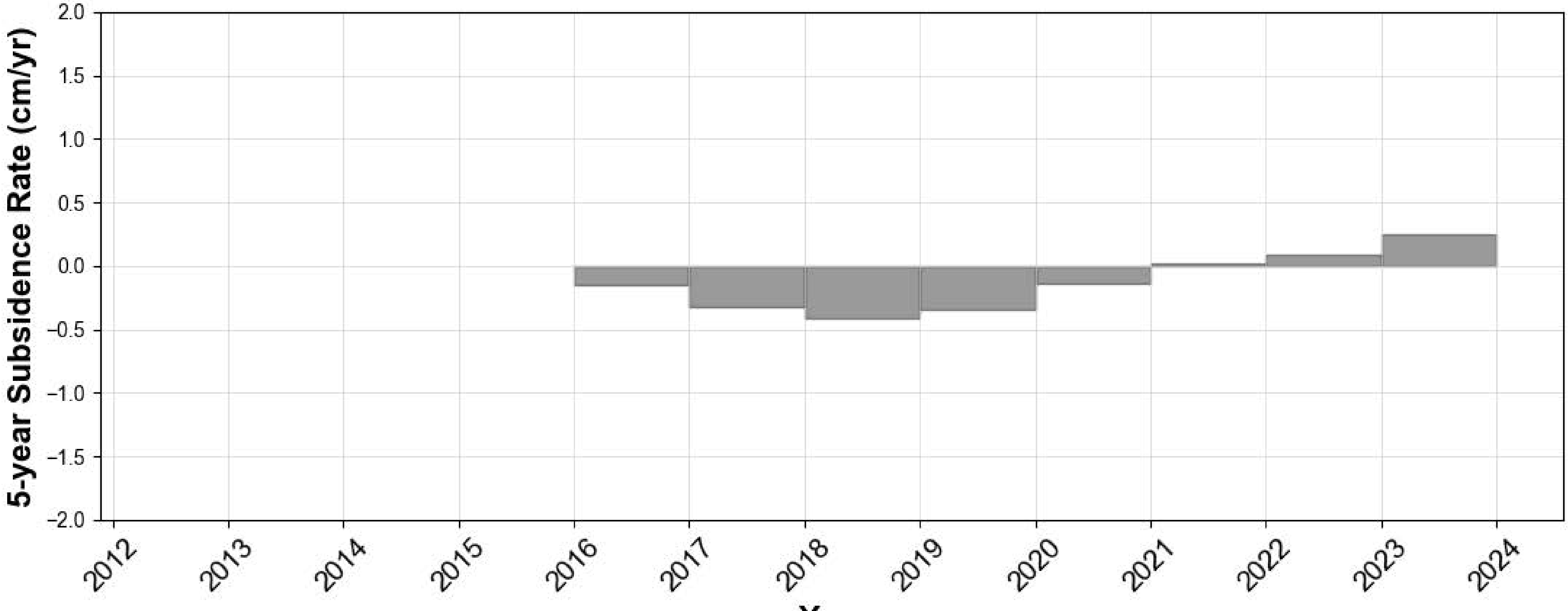
Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

JGS2

Dayton, TX







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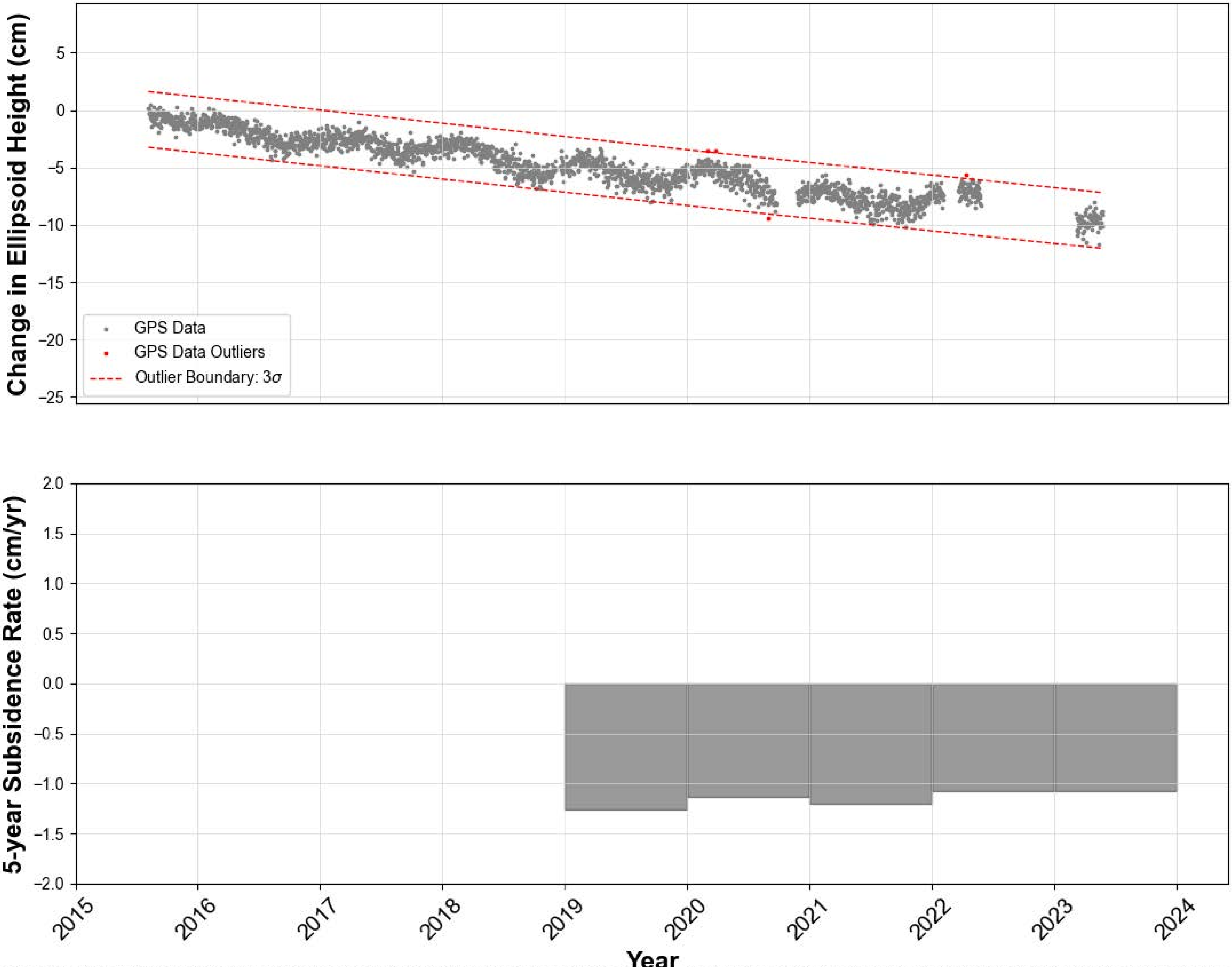
KKES

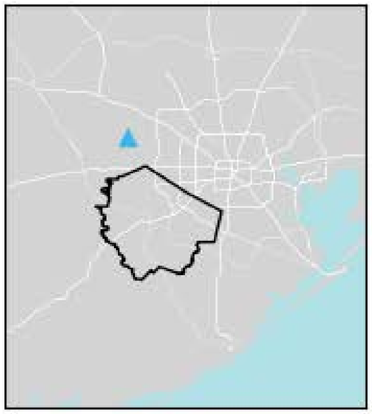
Houston, TX

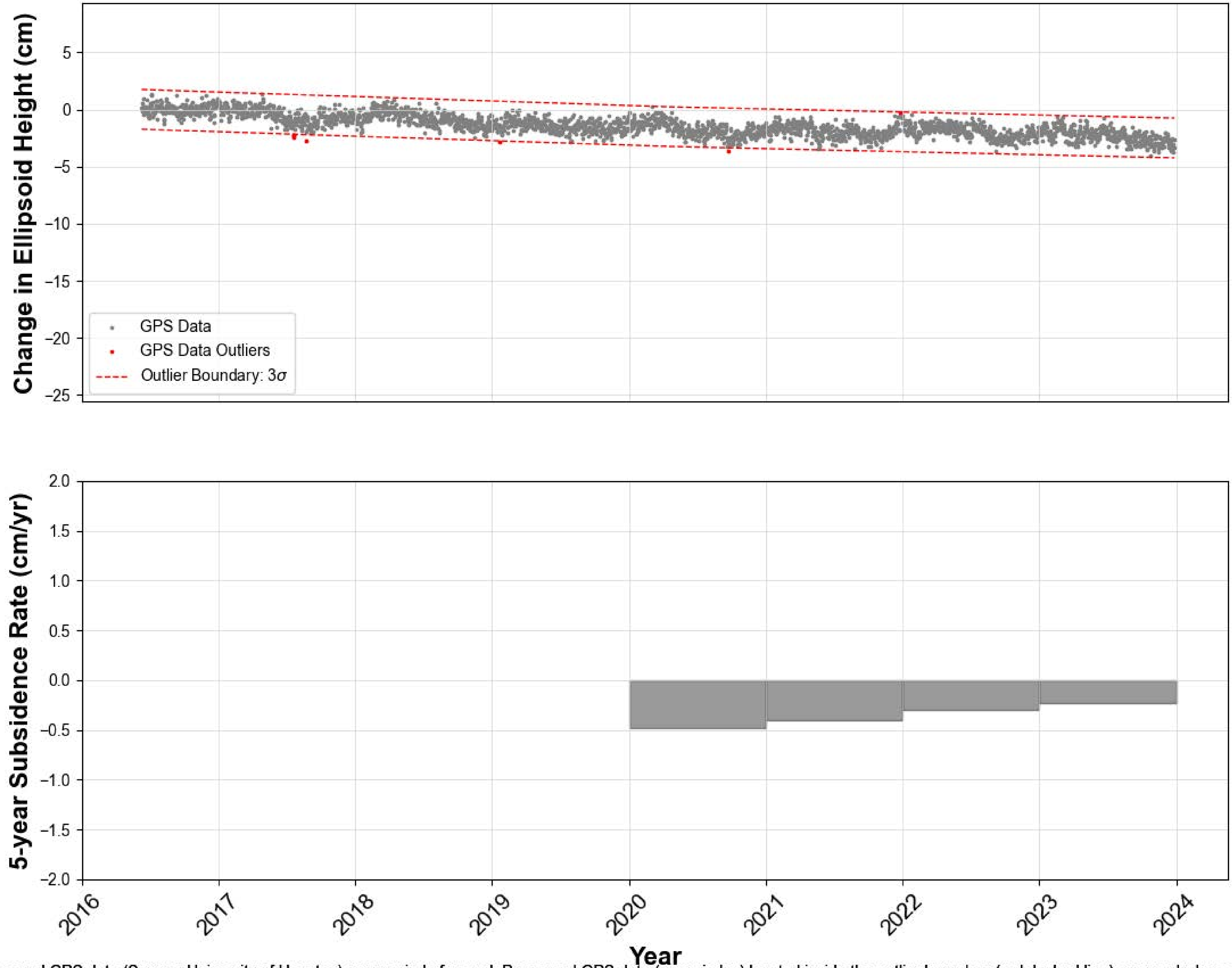


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

KPCD

Pattison, TX





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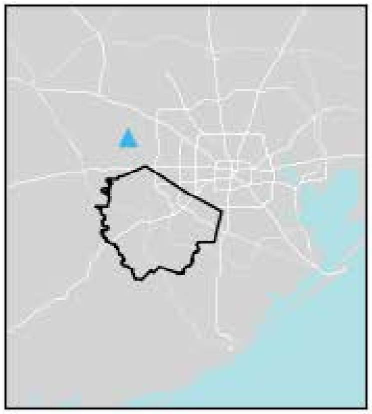
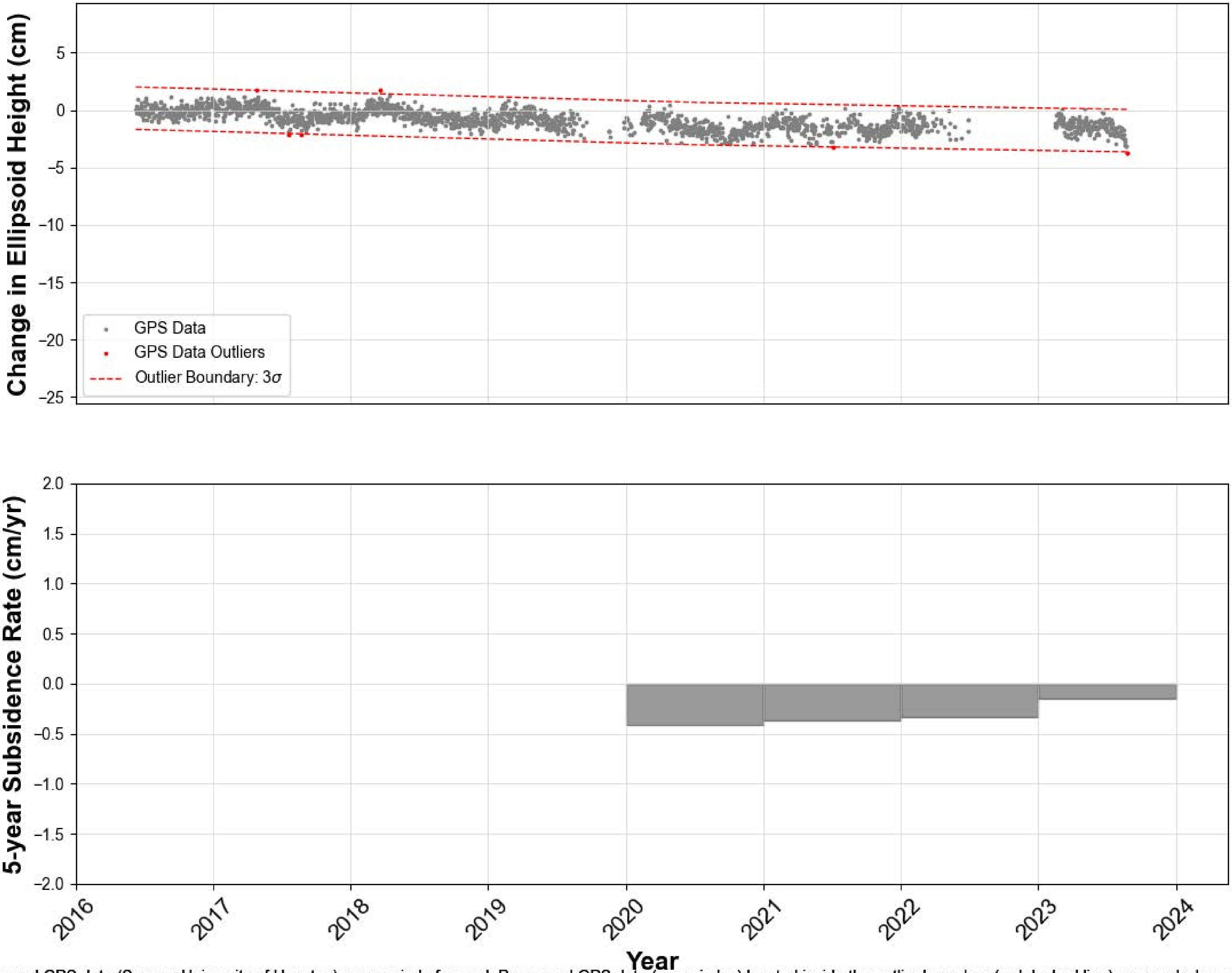
KPCS

Pattison, TX





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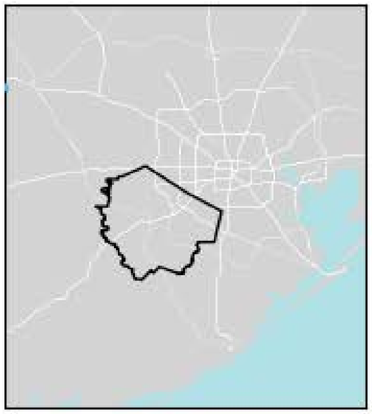
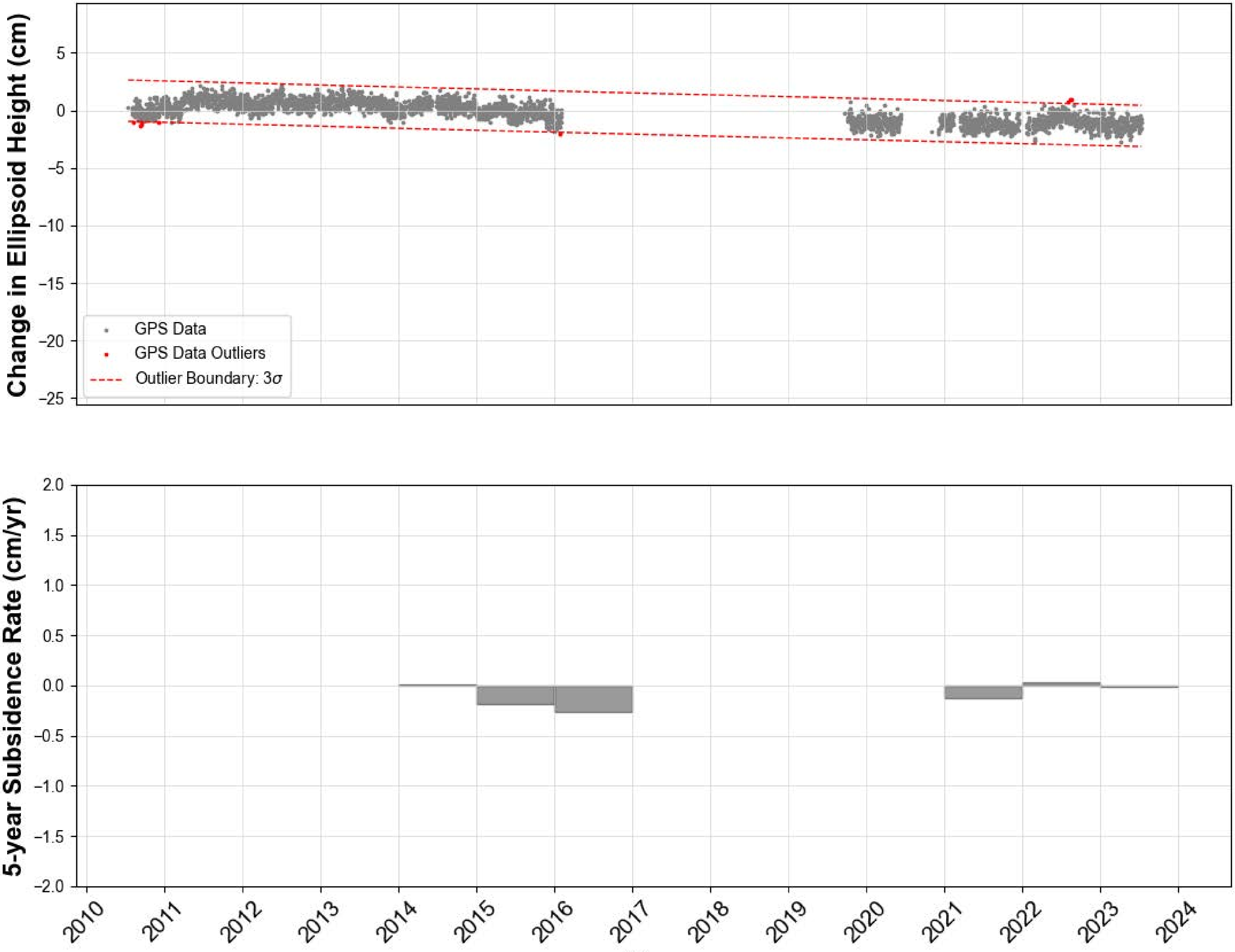
LCBR

Burton, TX

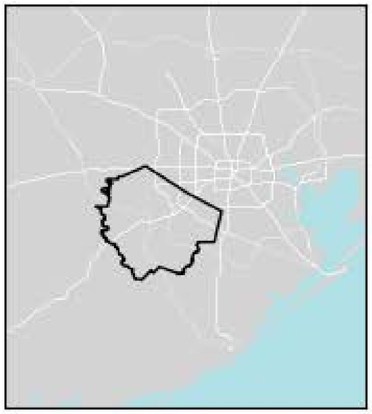


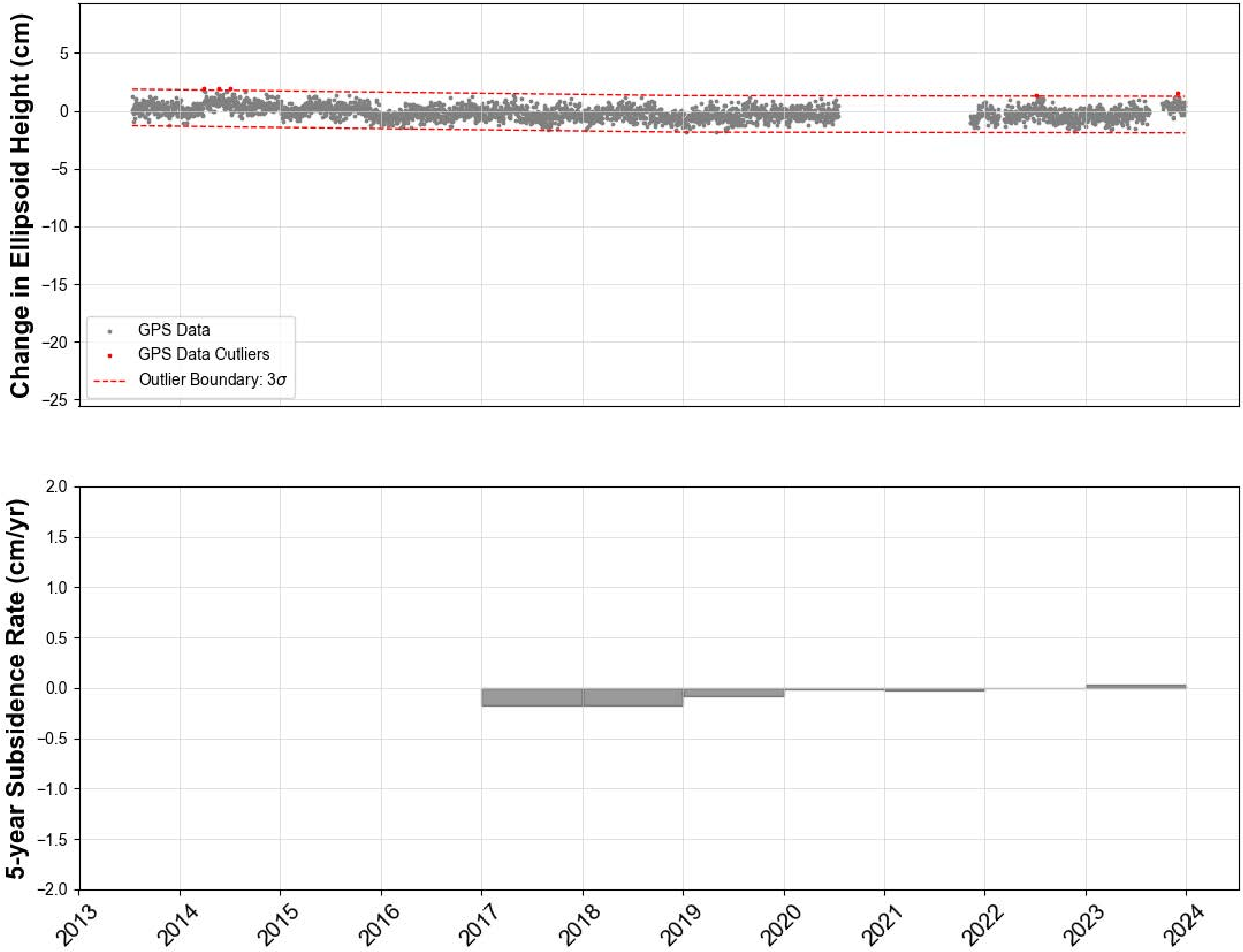


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

LGC1

Beaumont, TX

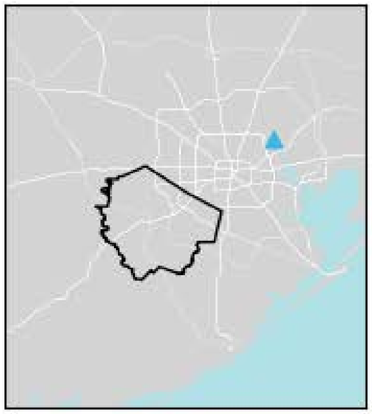


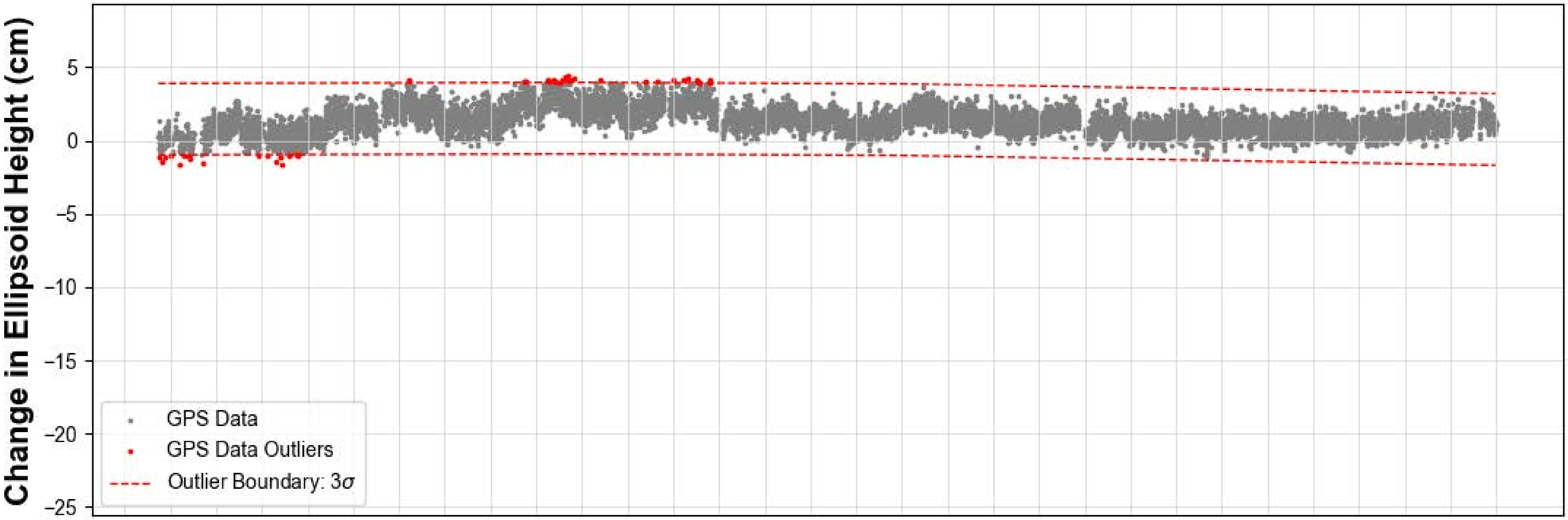


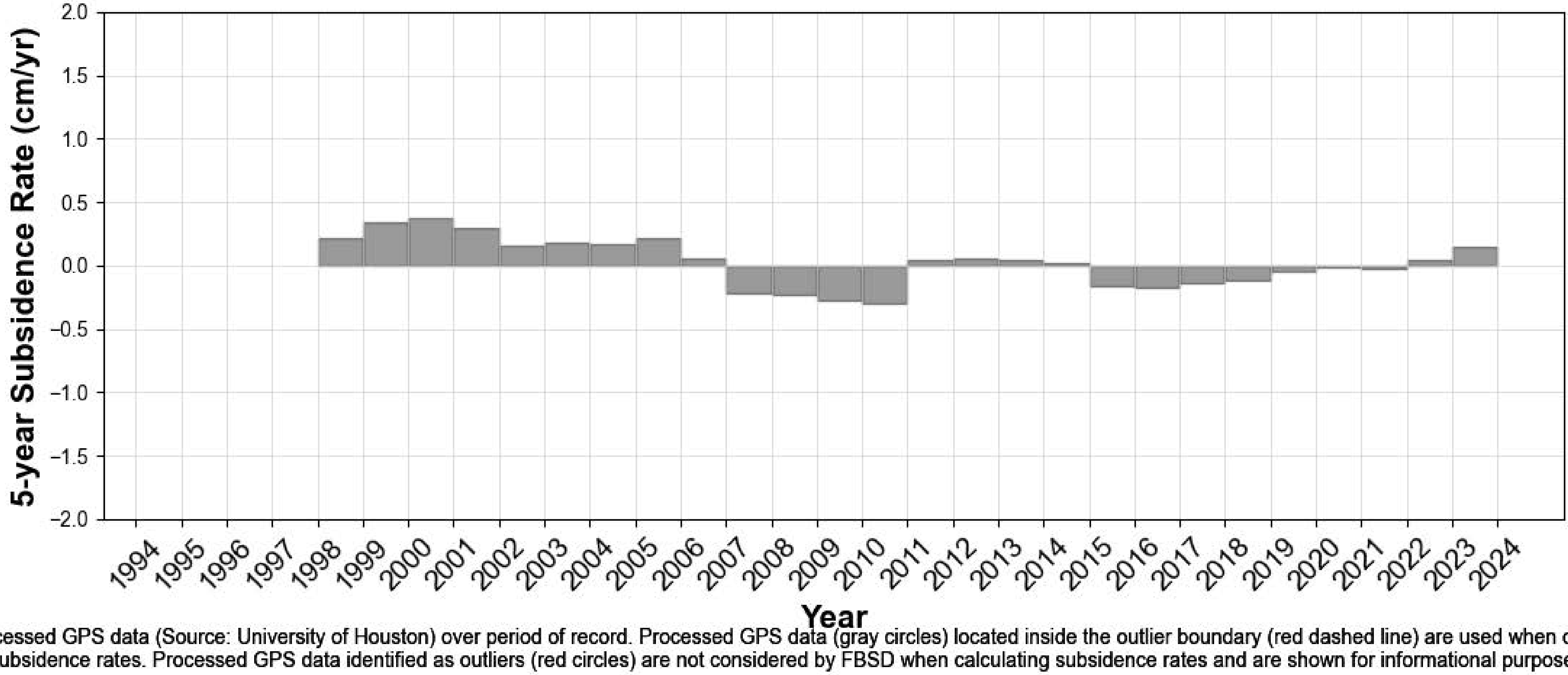
Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

LKHU

Houston, TX



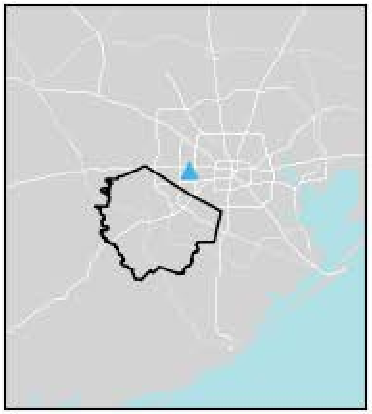


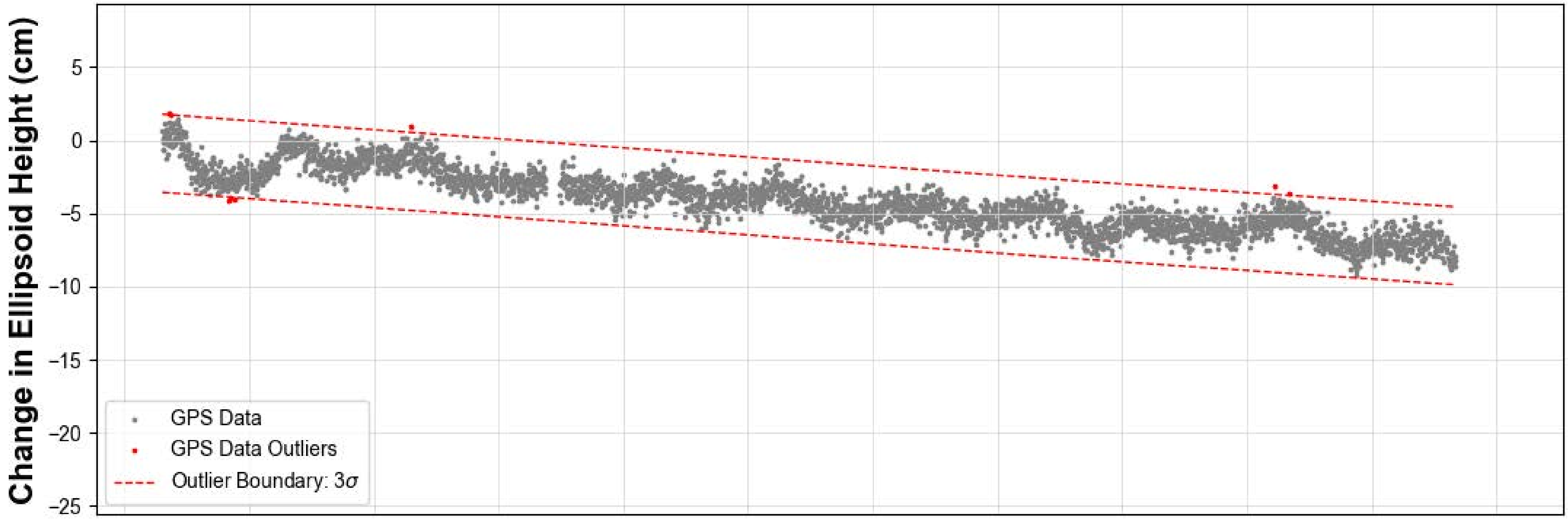


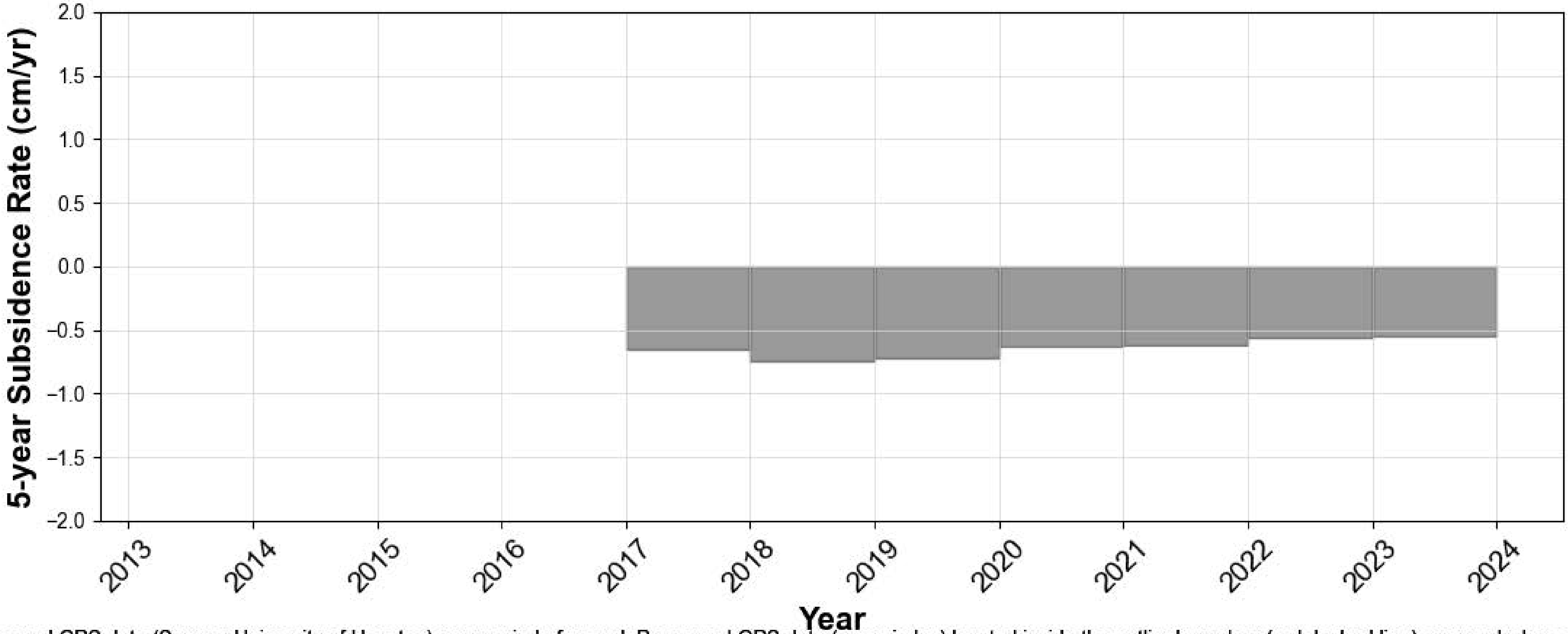
Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

MDWD

Houston, TX



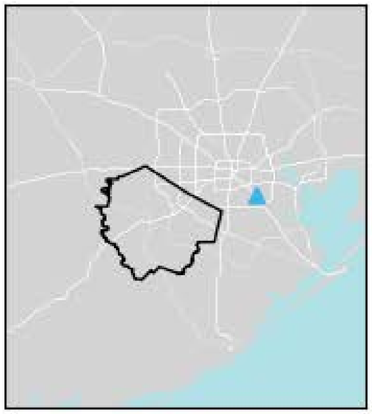


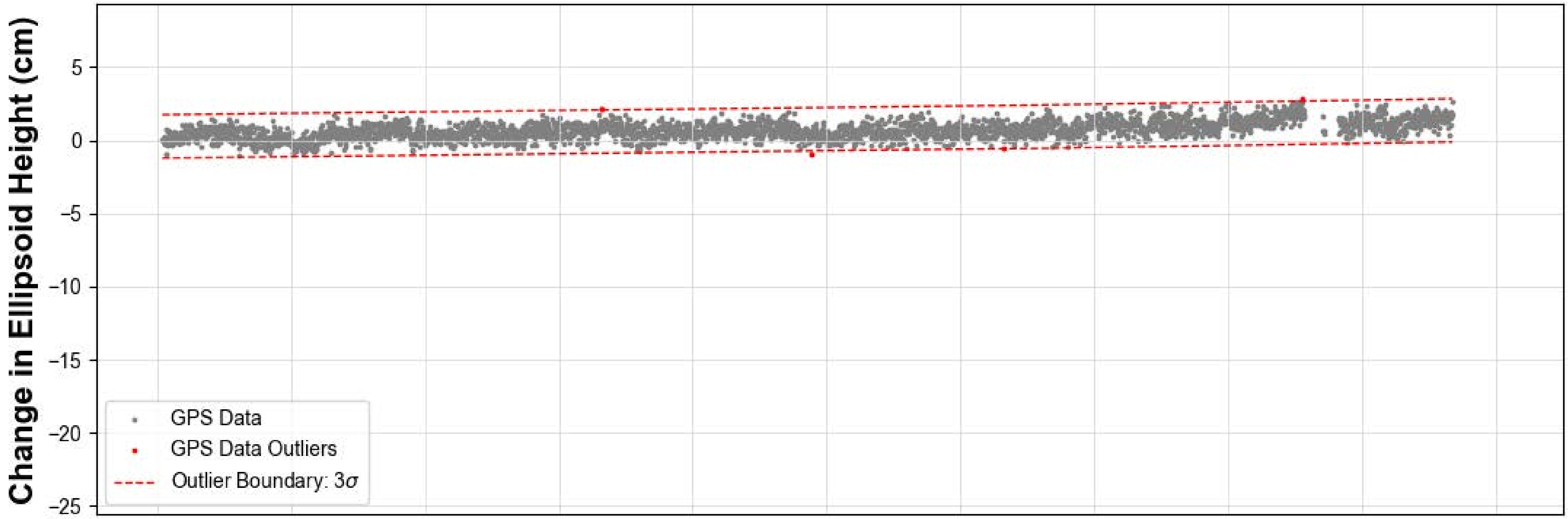


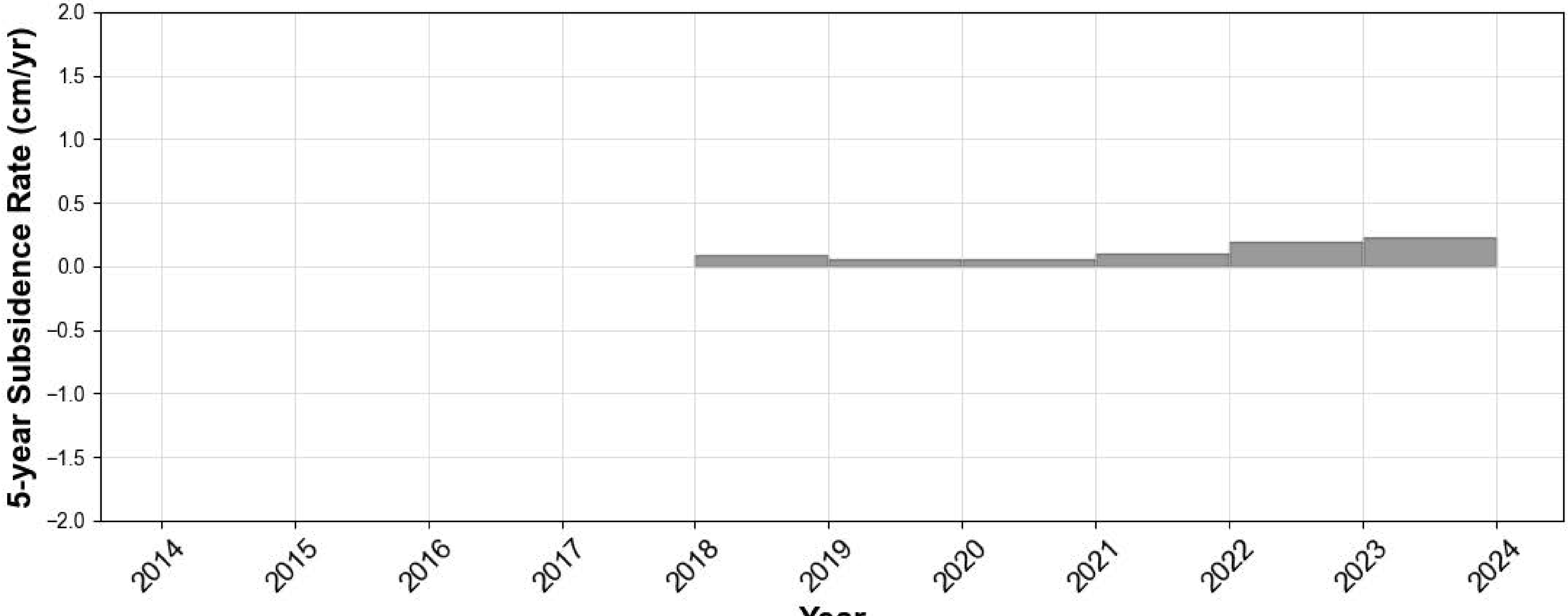
Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

MEPD

South Houston, TX



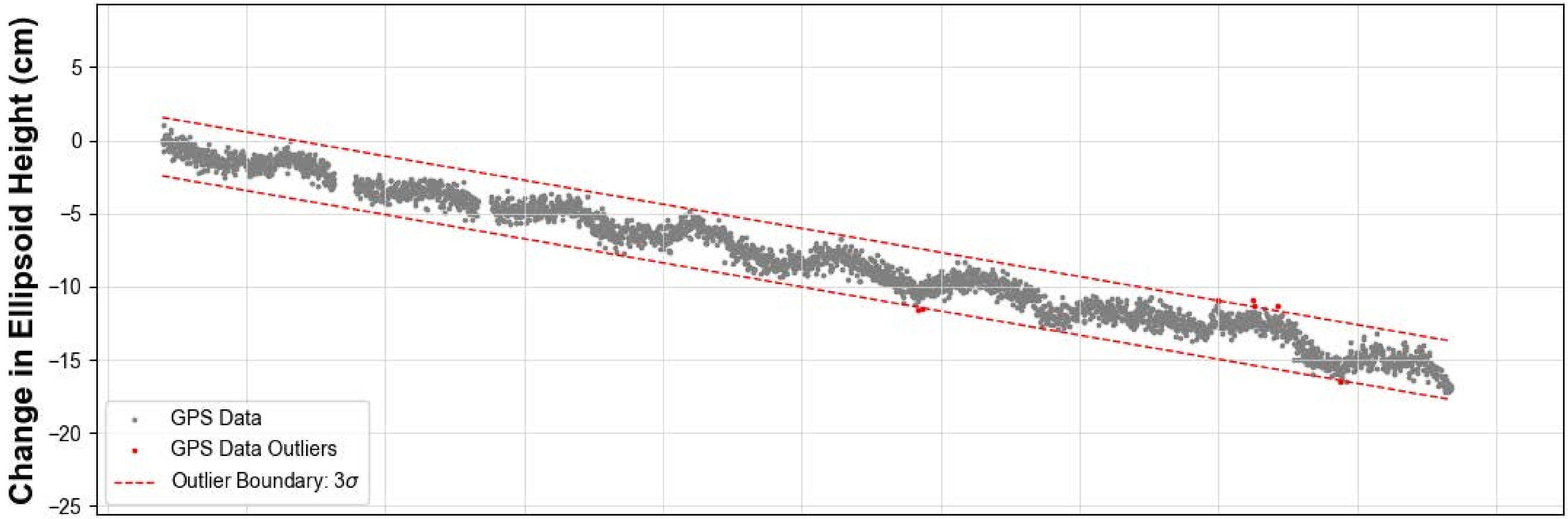


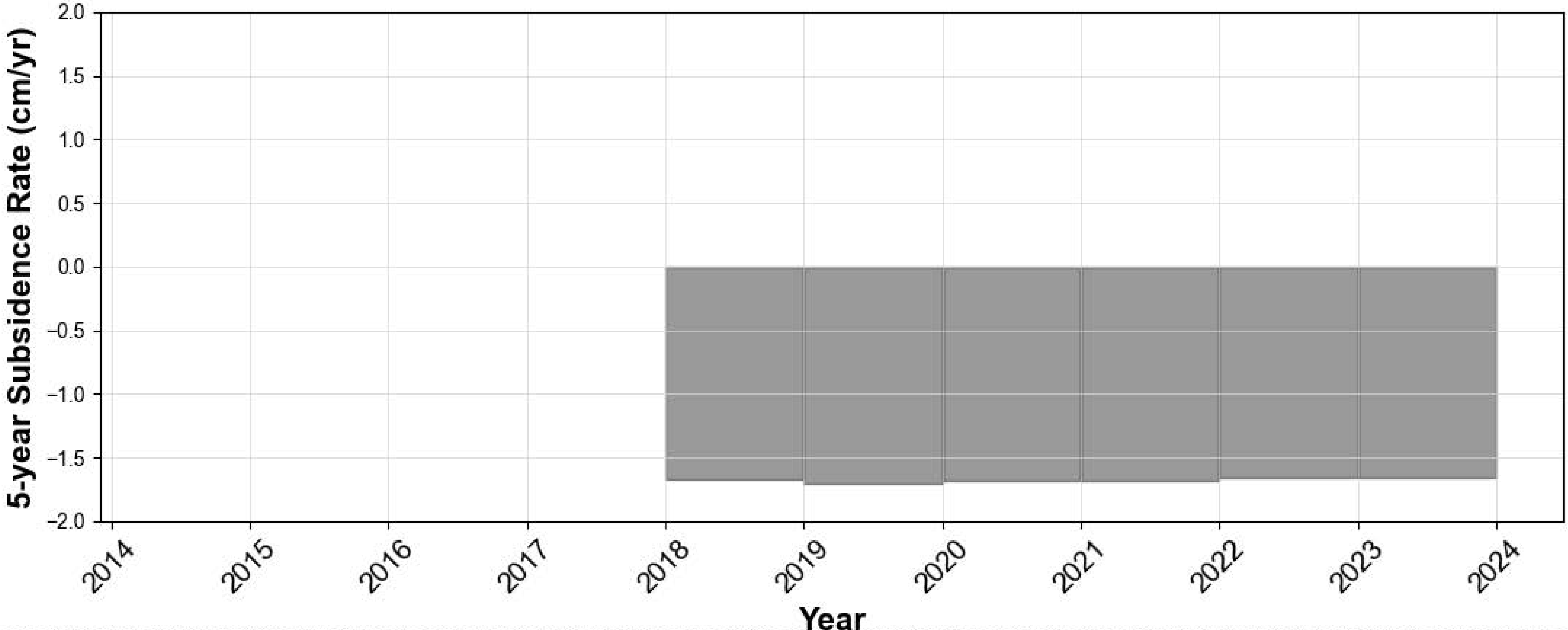


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

MRHK

Katy, TX

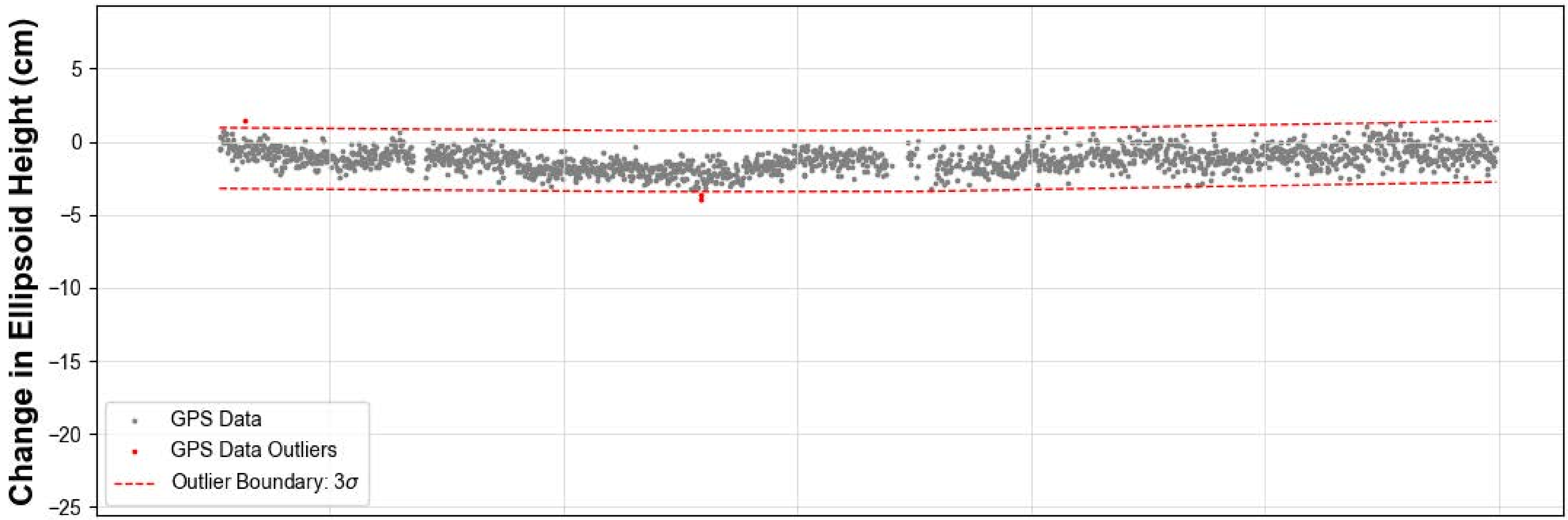


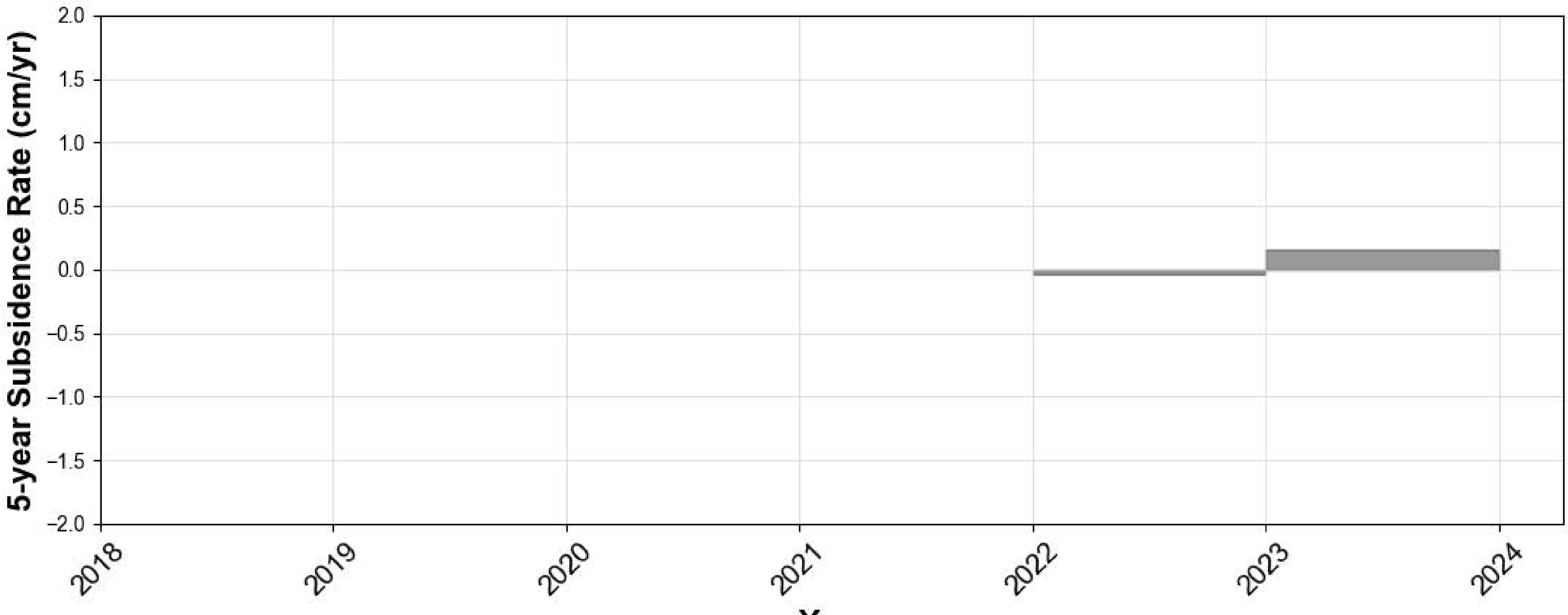


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

N301

Galveston, TX

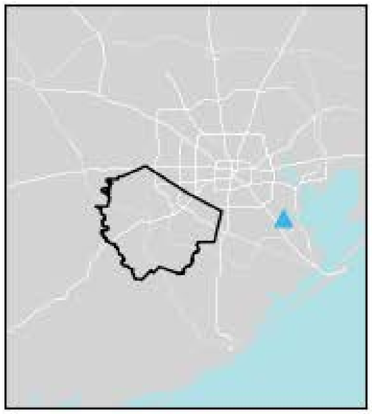


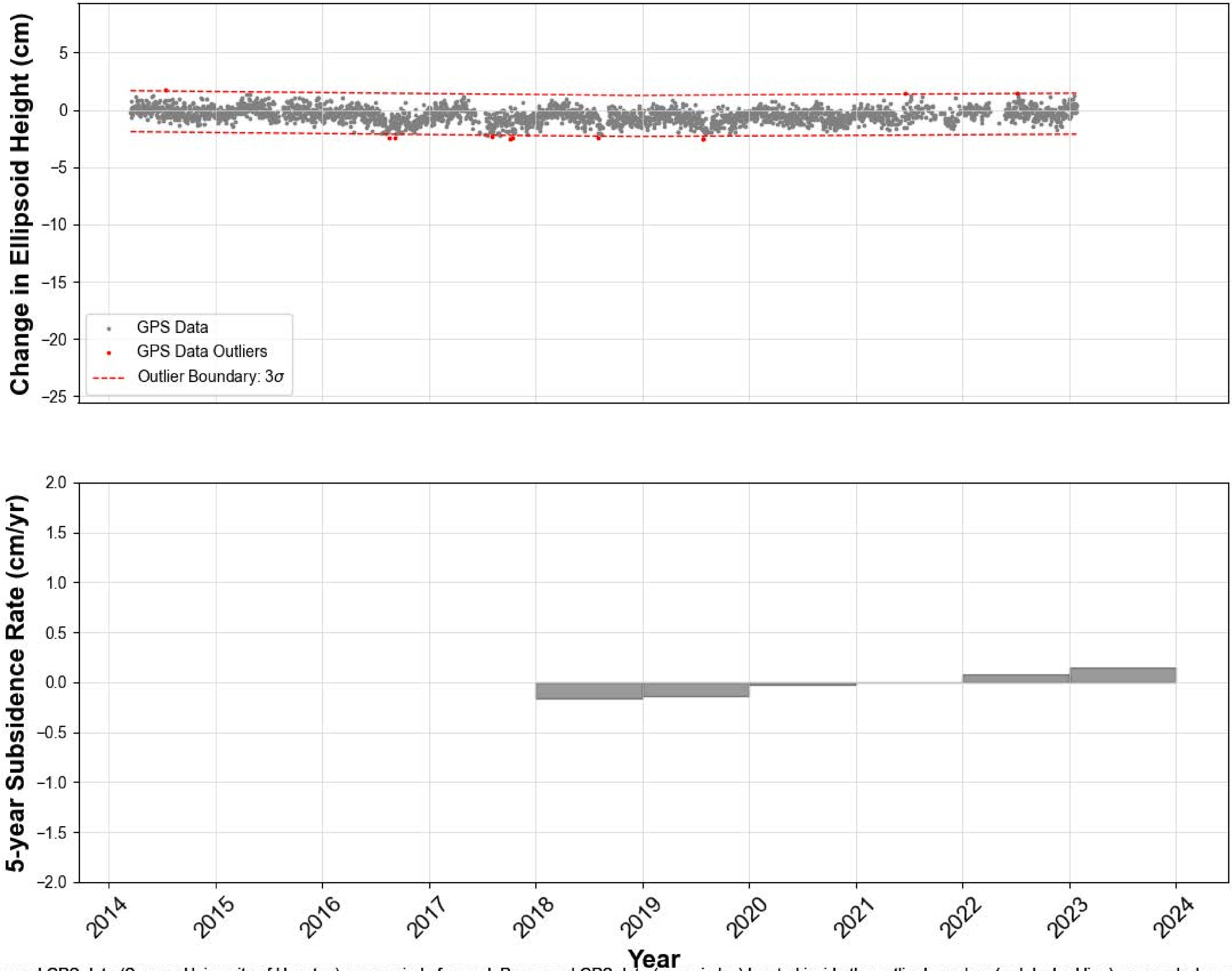


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

NASA

Houston, TX

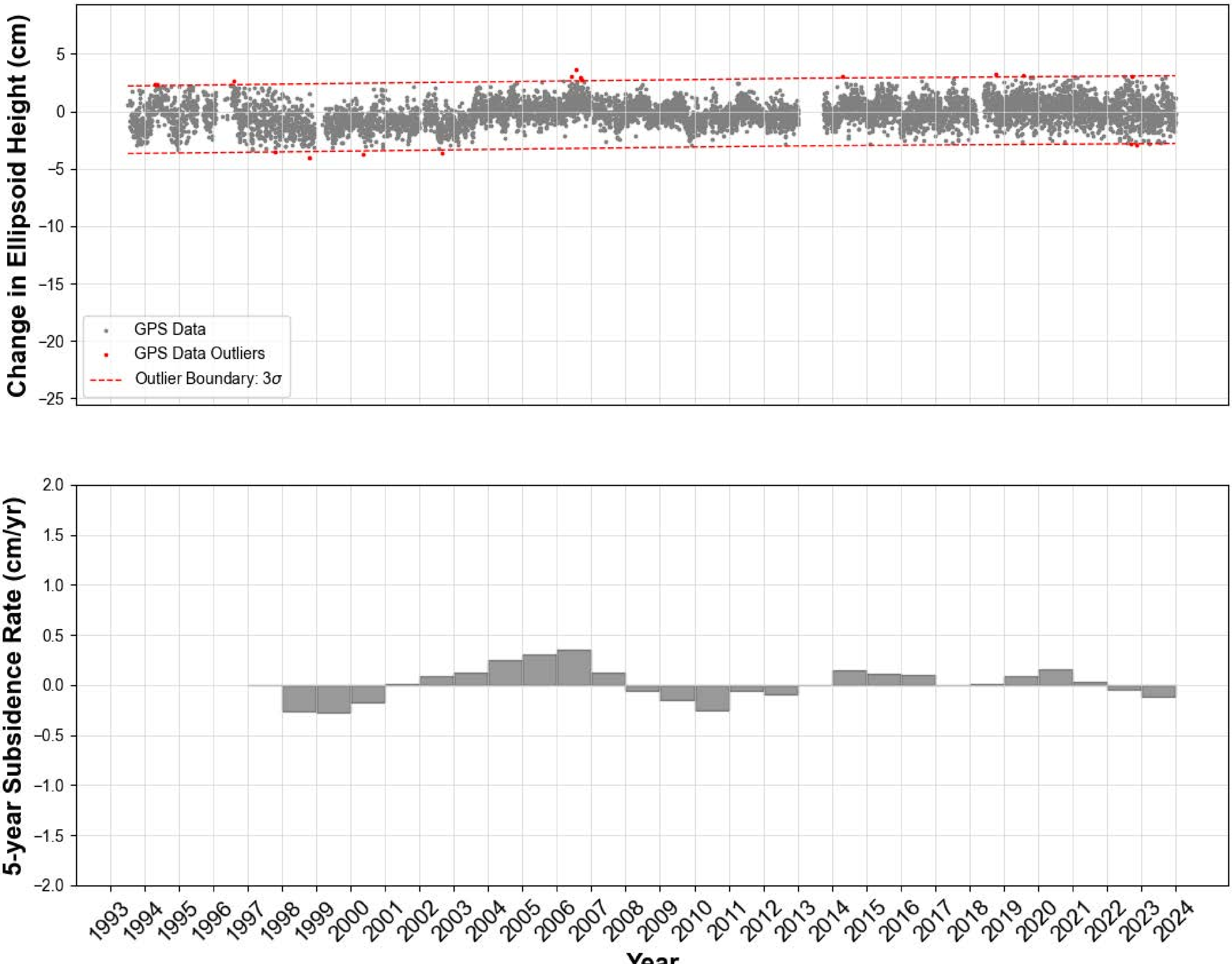




Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

NETP

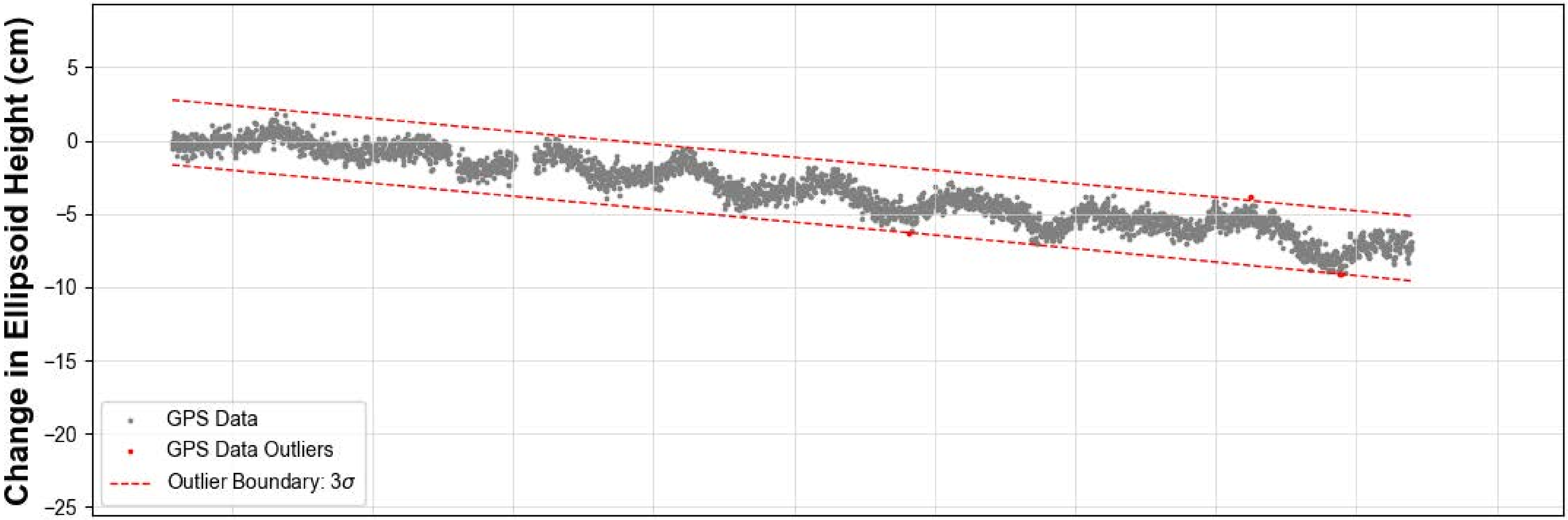
Houston, TX

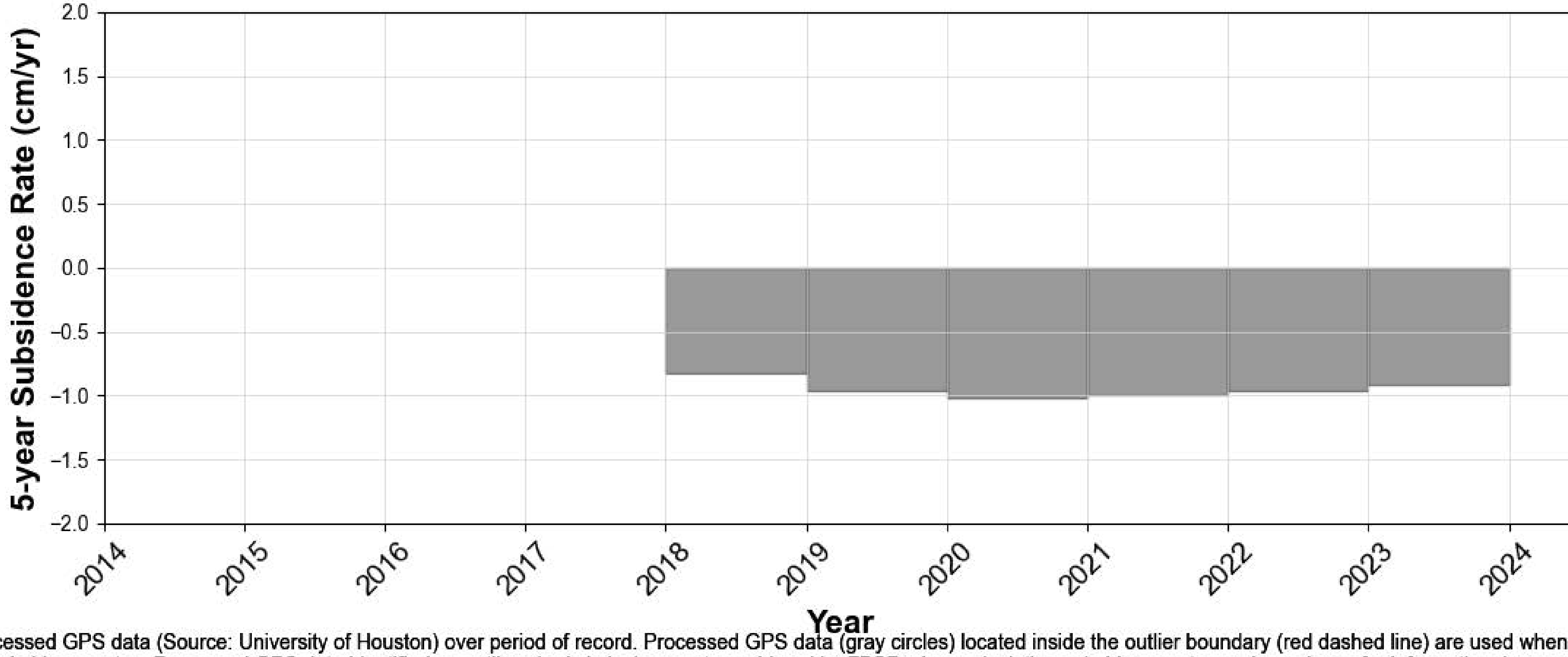


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

OKEK

Katy, TX

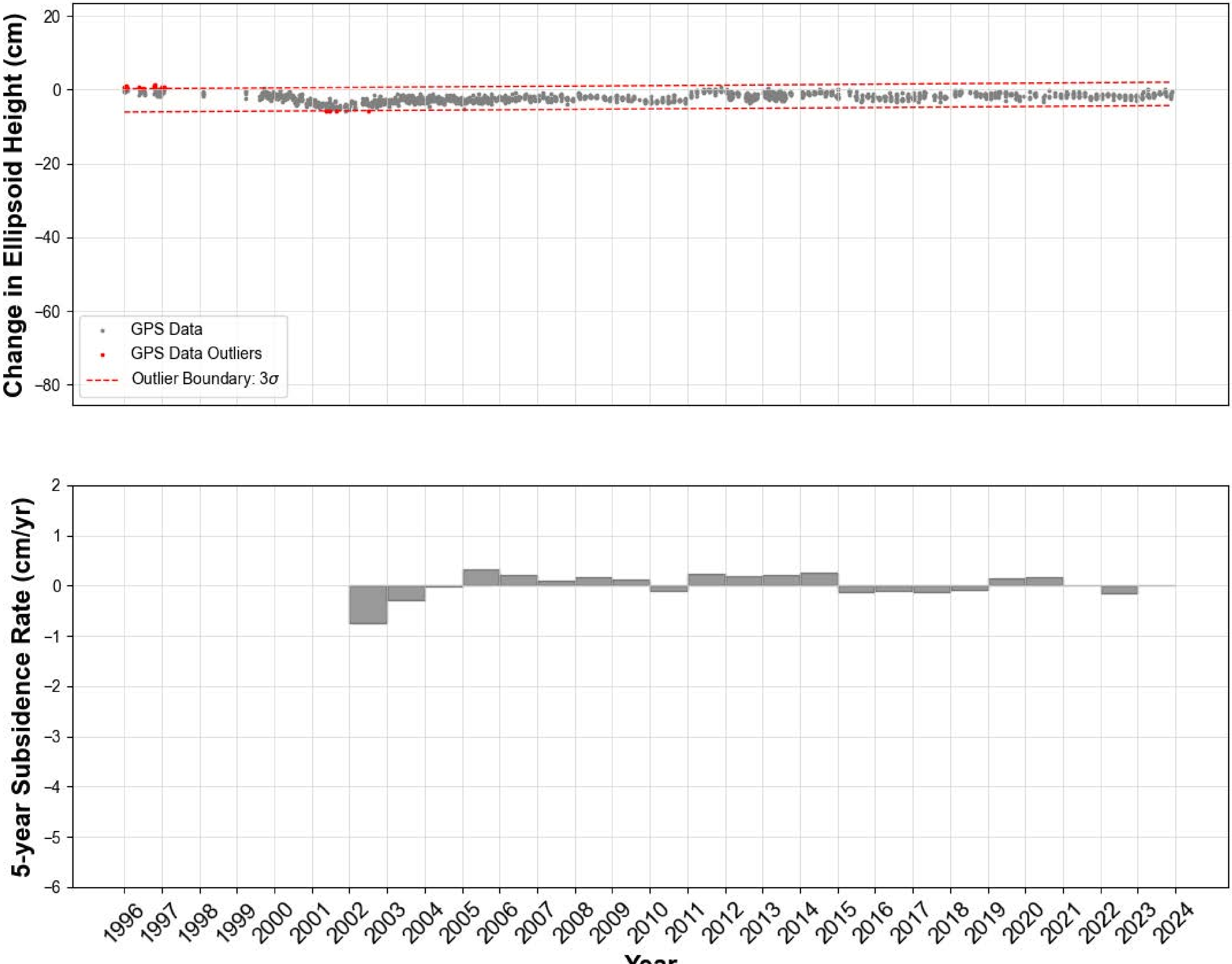




Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P000

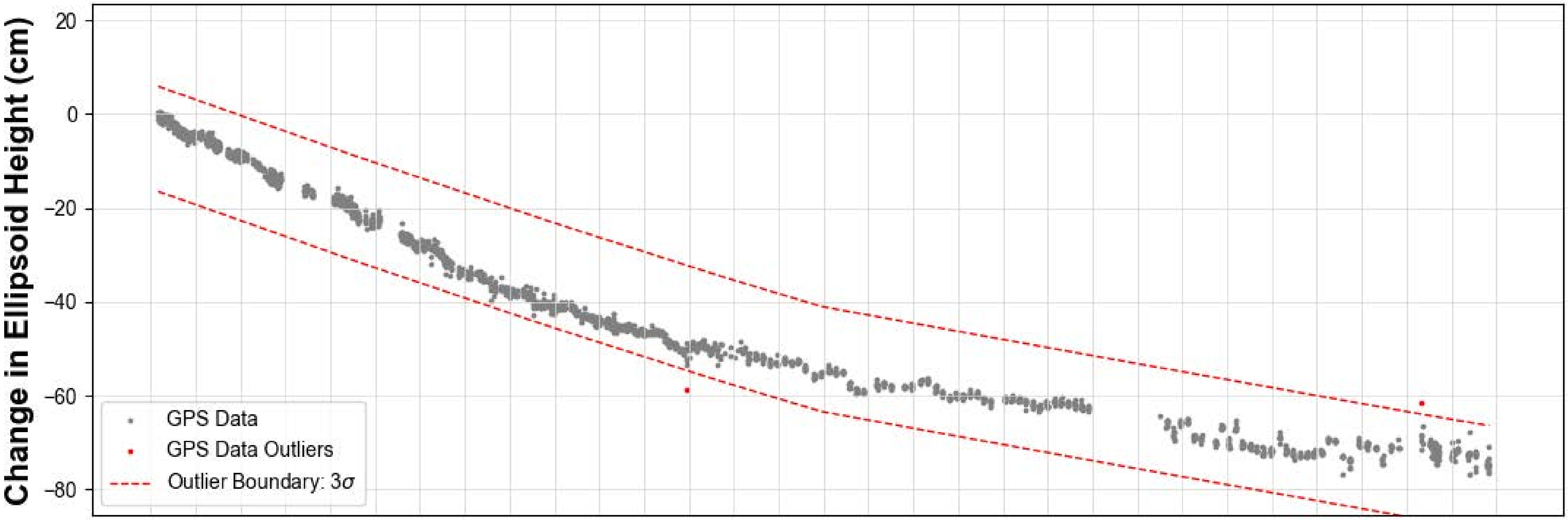
Friendswood, TX

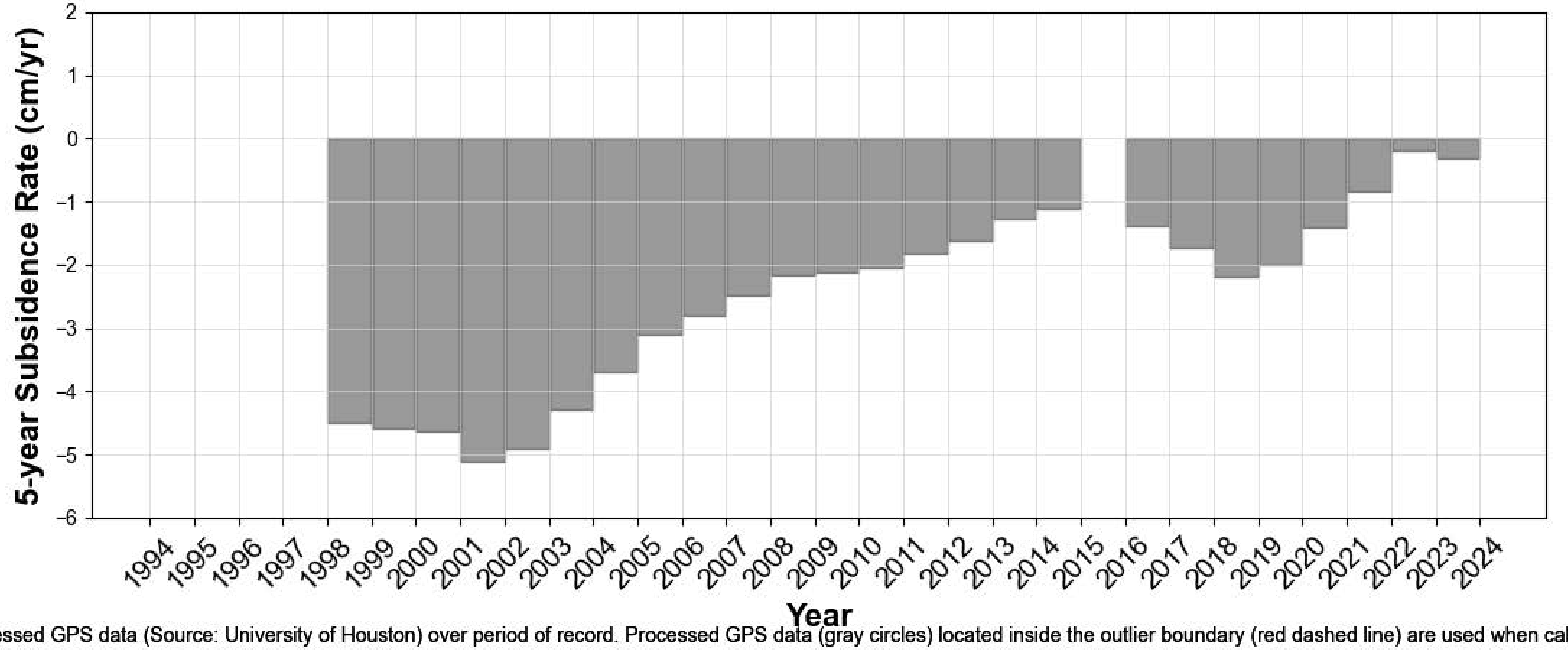


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

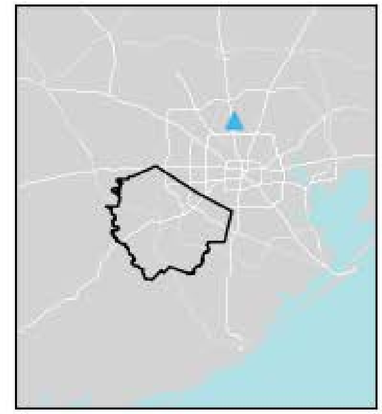
P001

Houston, TX



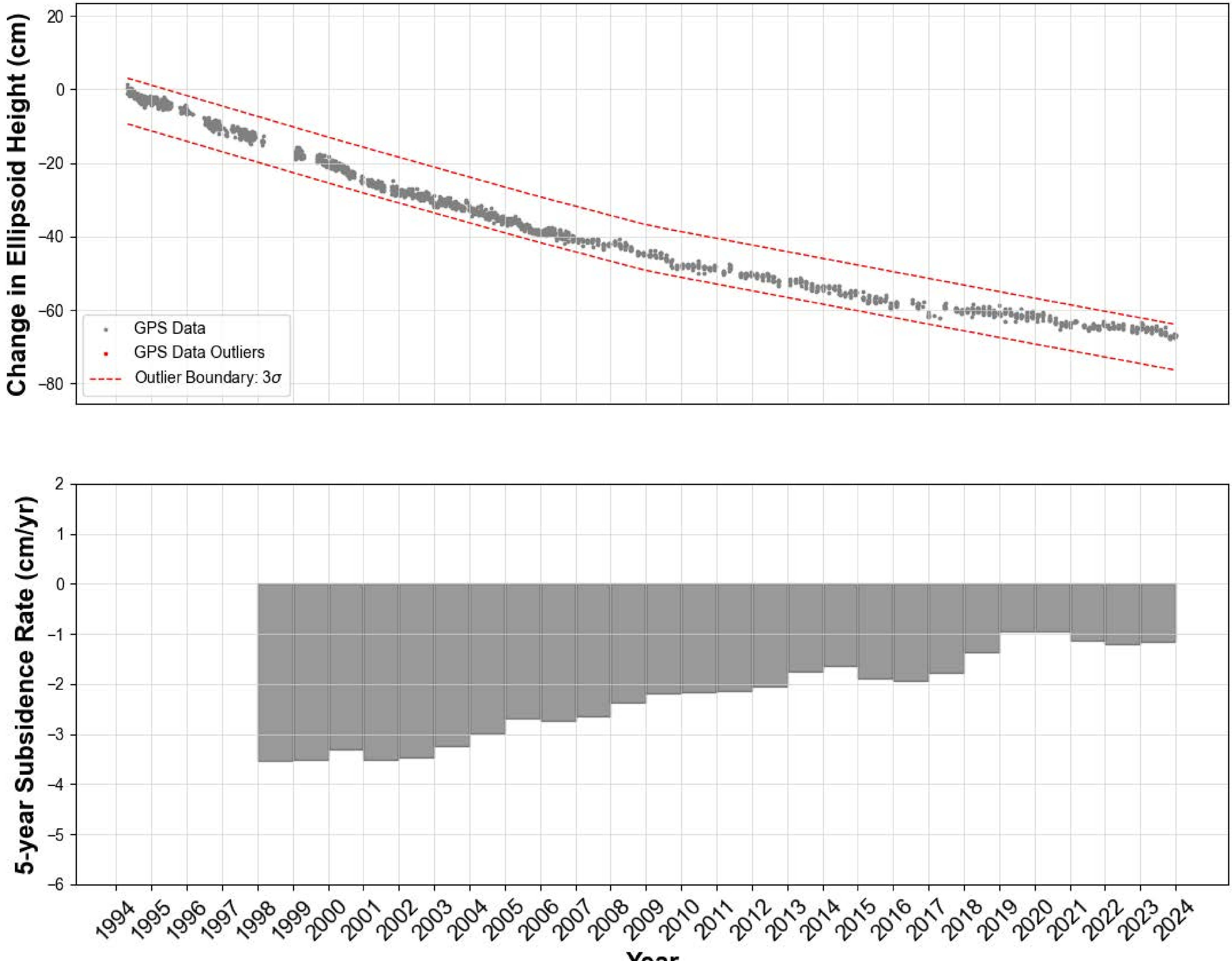


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.



P002

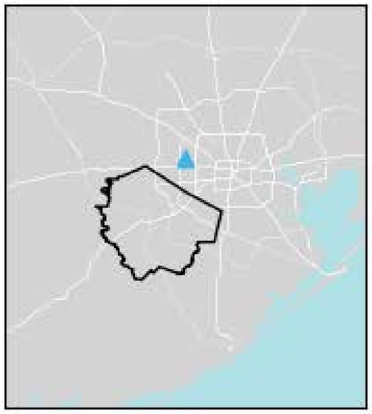
Houston, TX

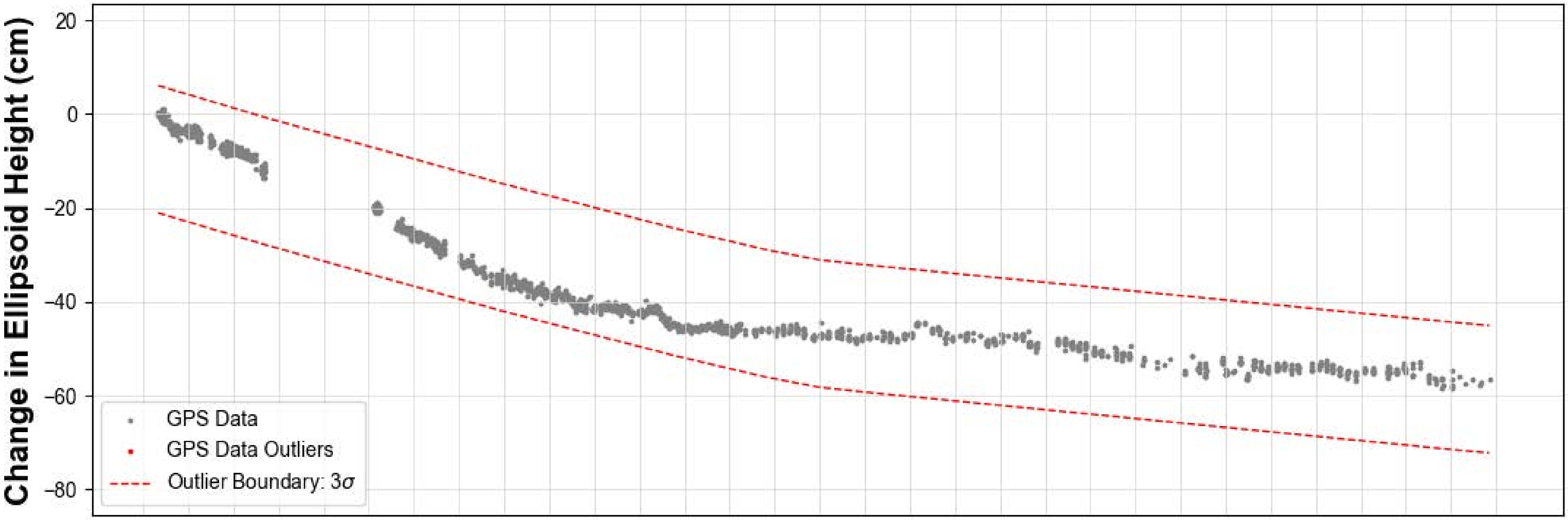


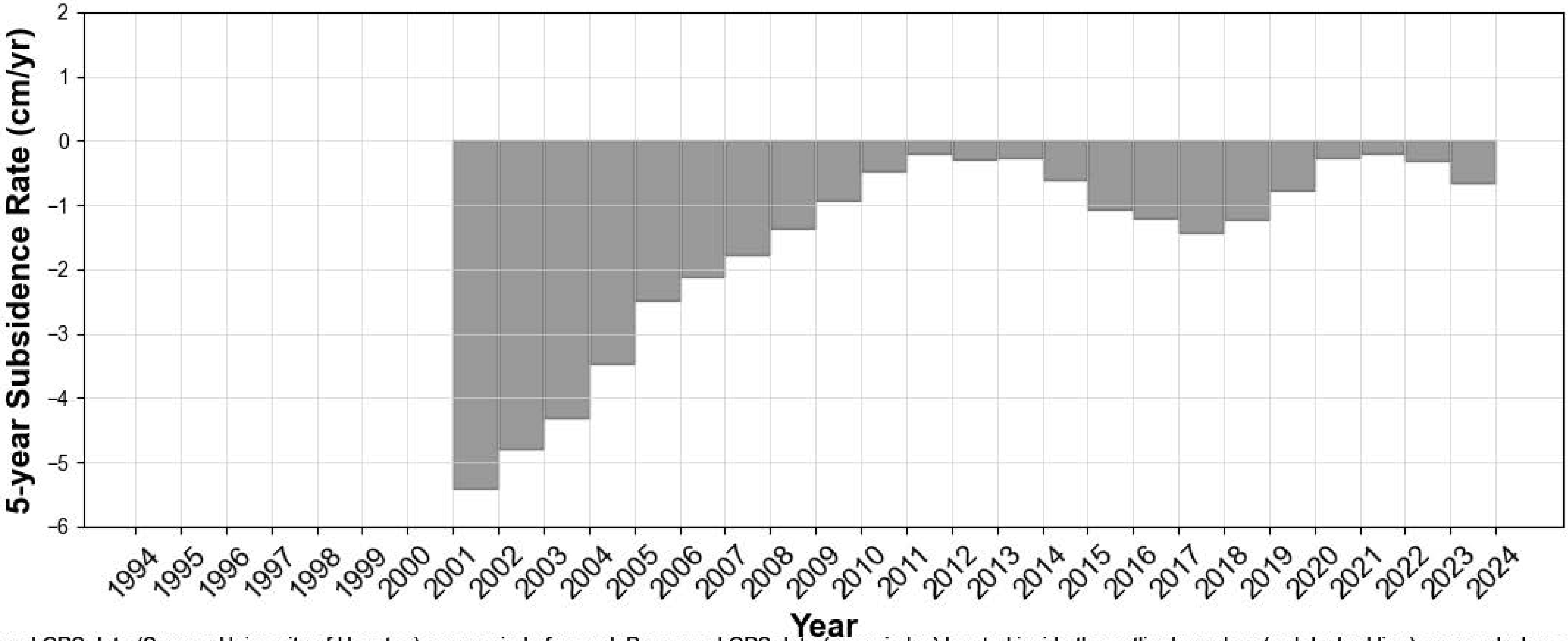
Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P003

Houston, TX



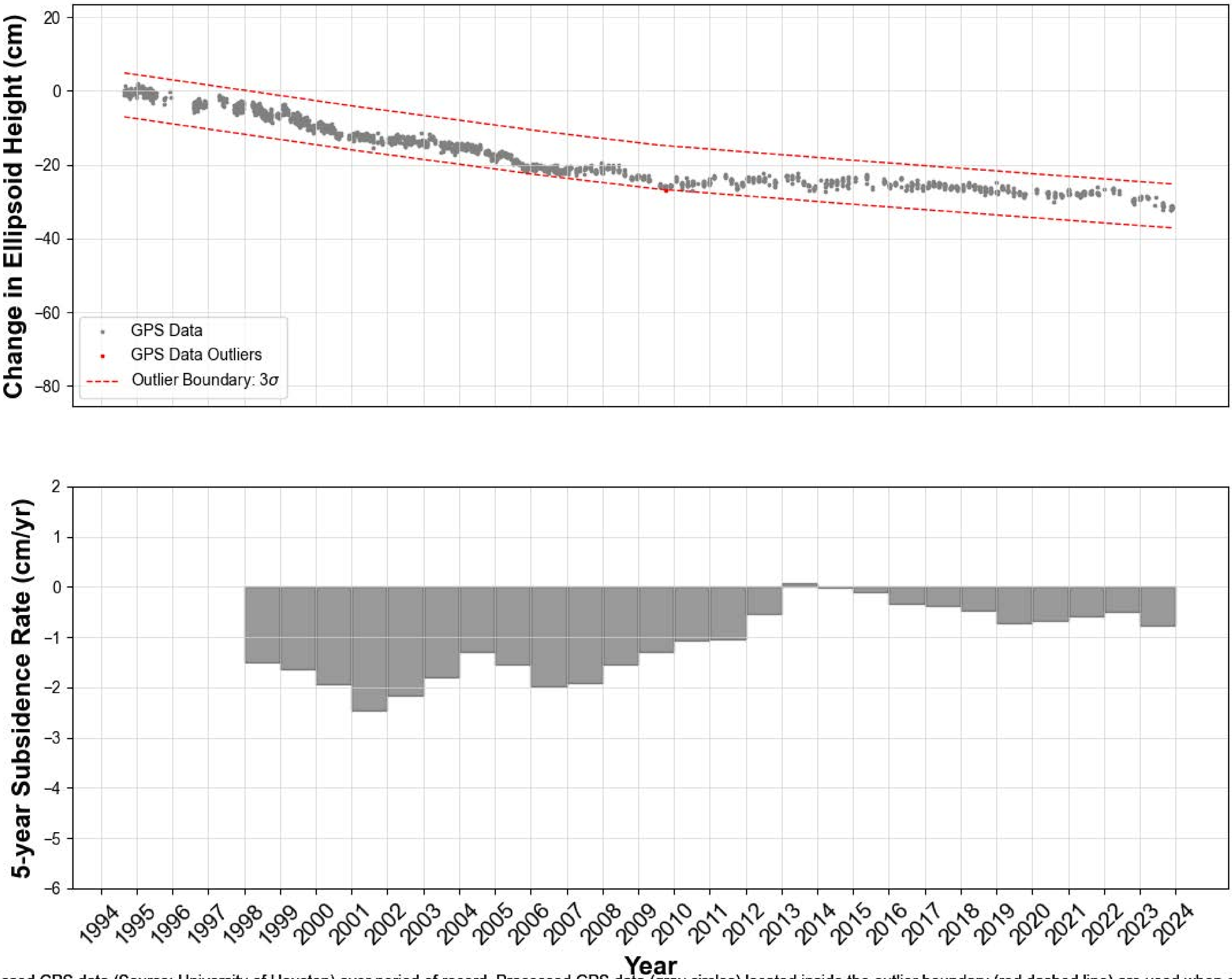




Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P004

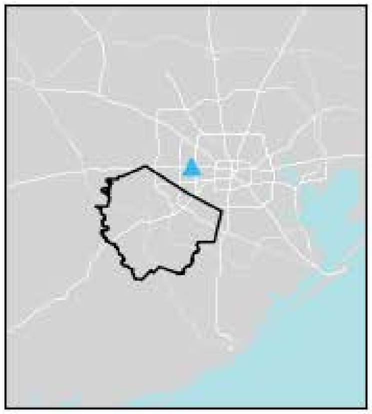
Sugar Land, TX

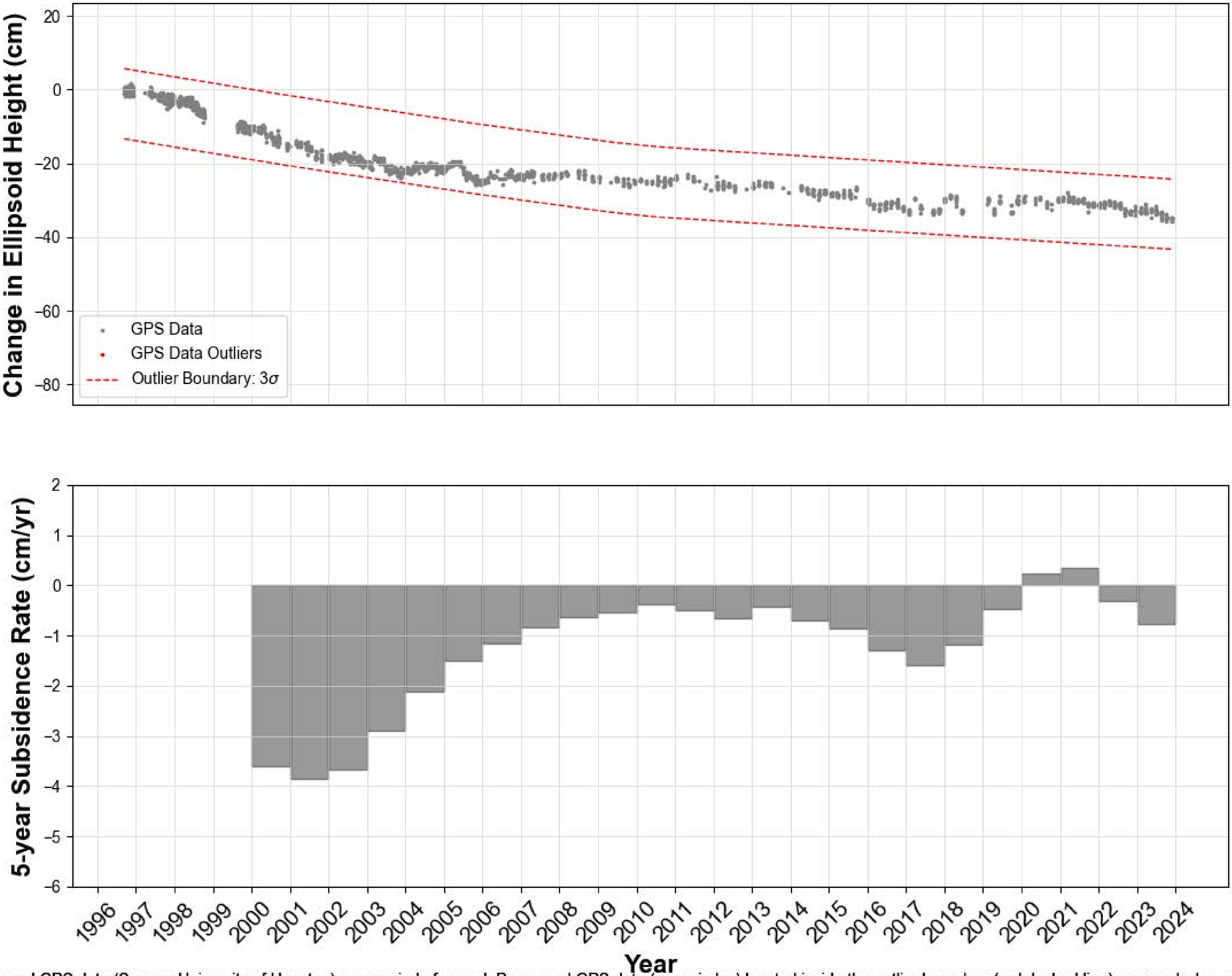


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P005

Houston, TX

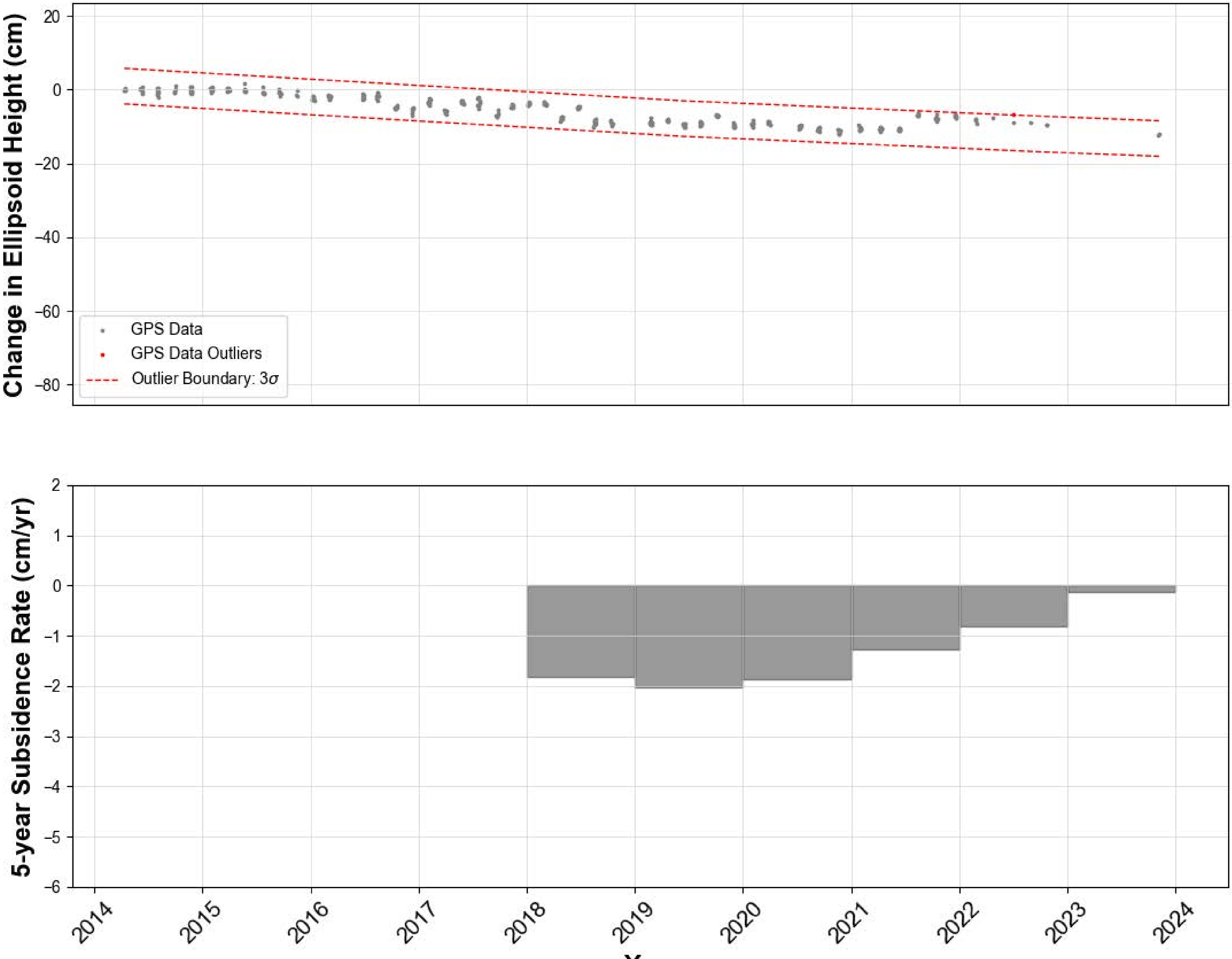




Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P006

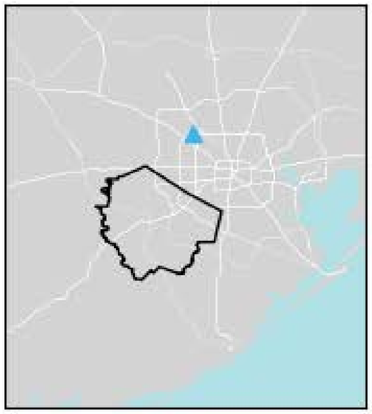
Houston, TX

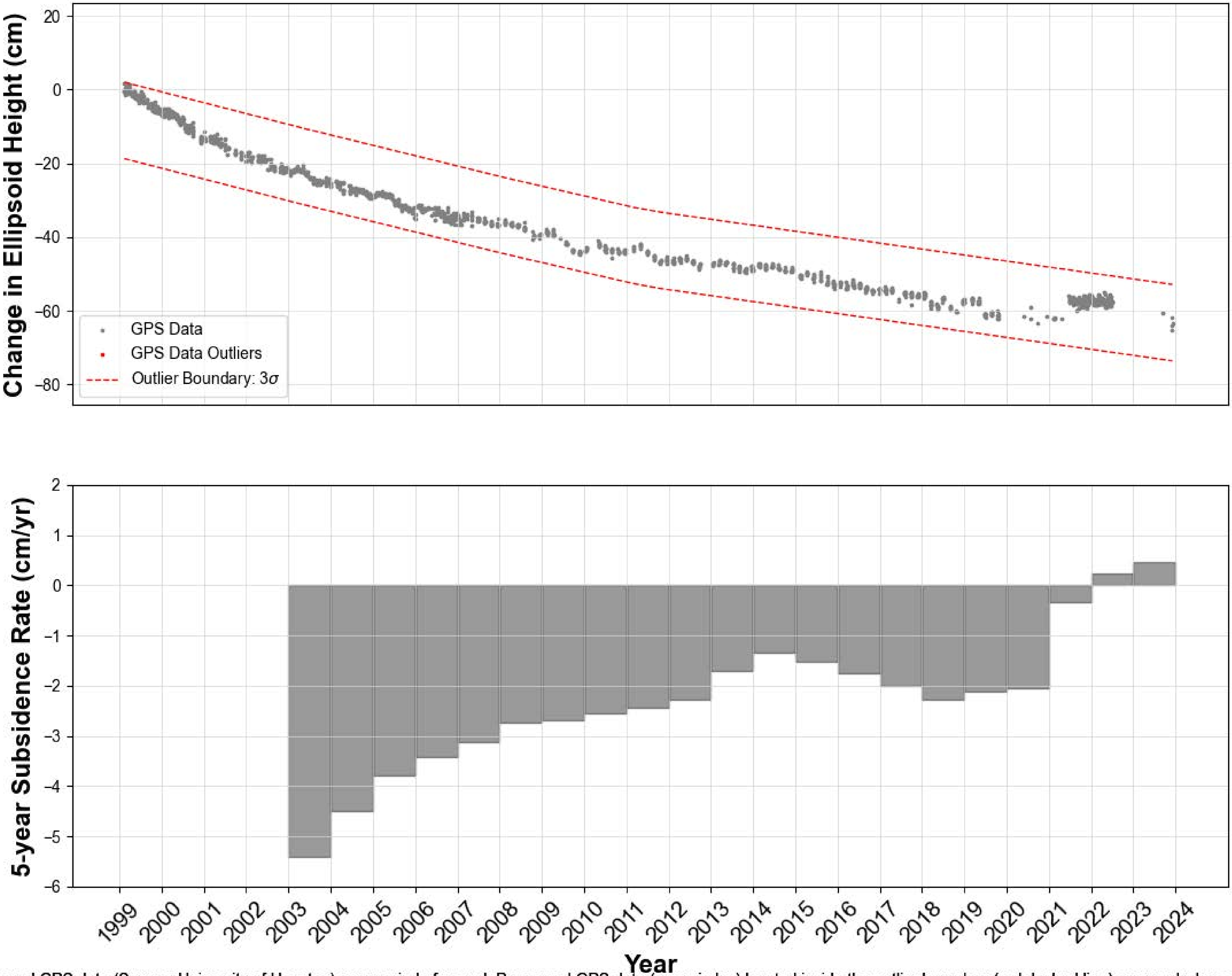


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P007

Houston, TX

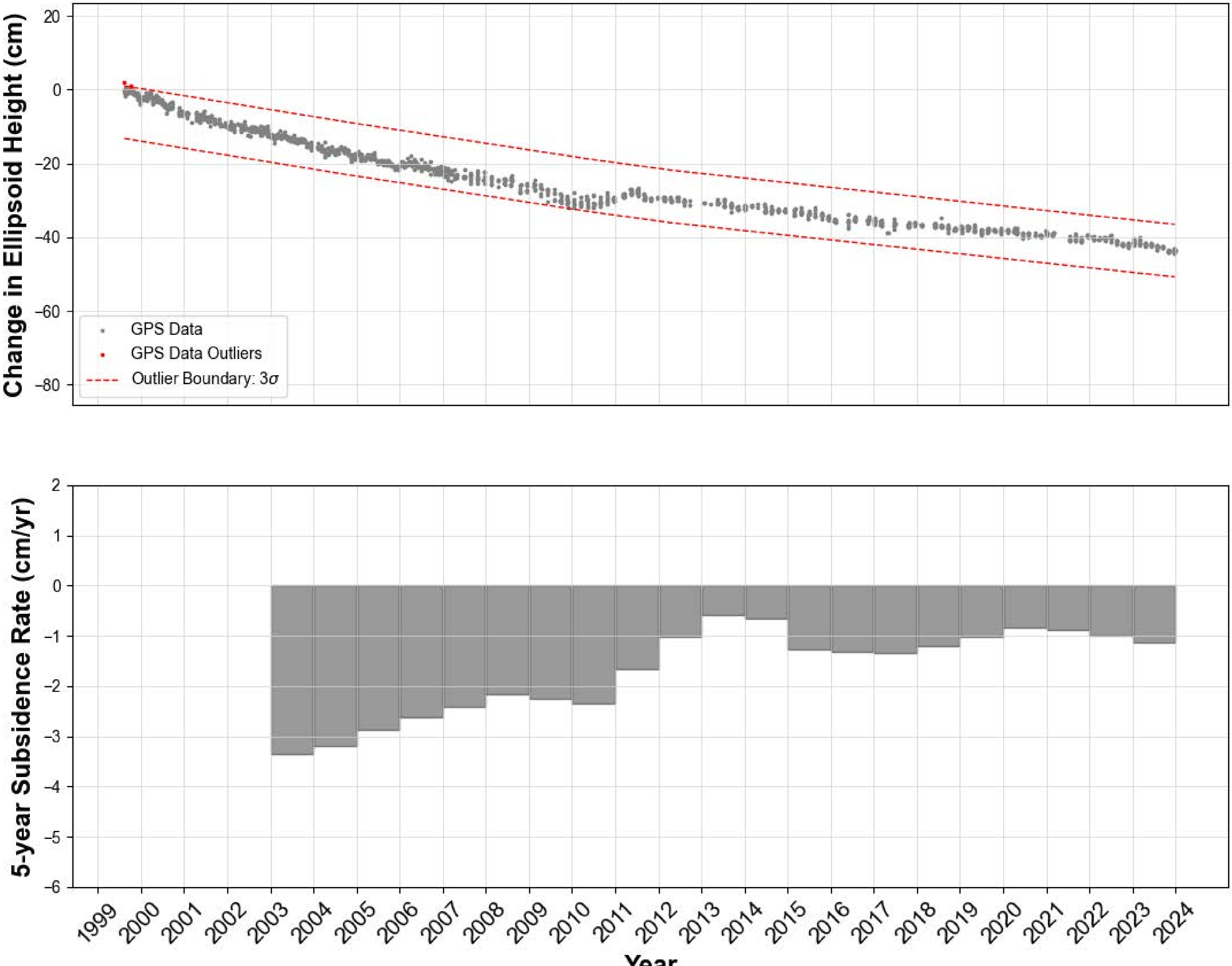




Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P008

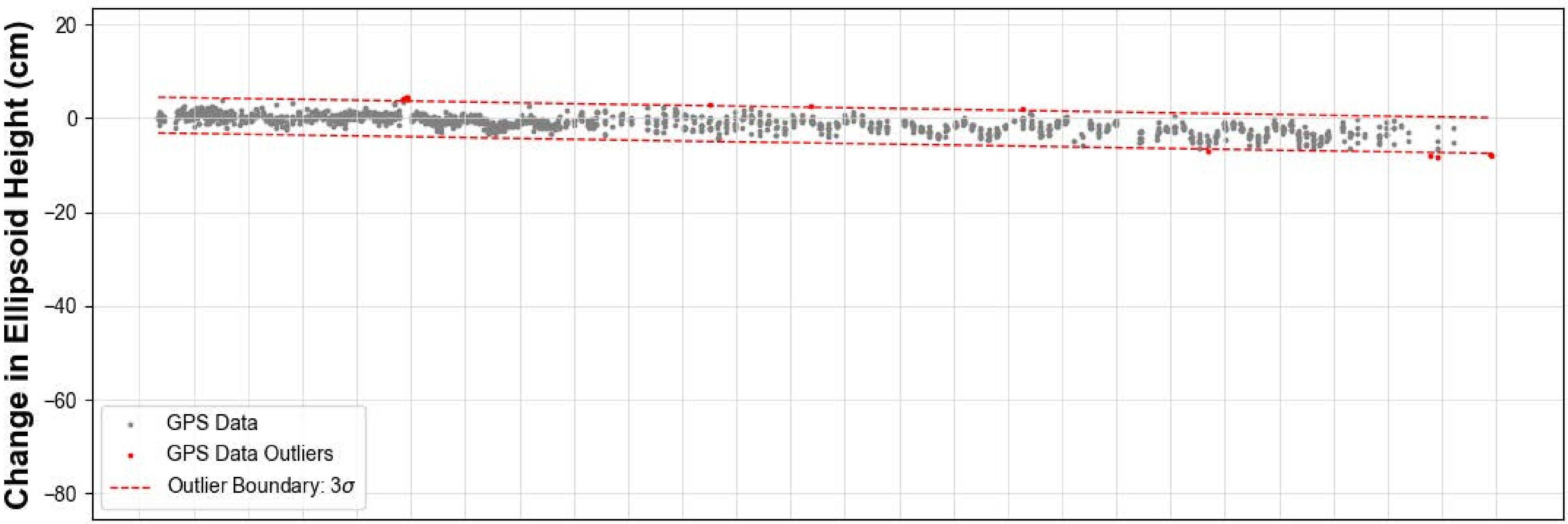
Houston, TX

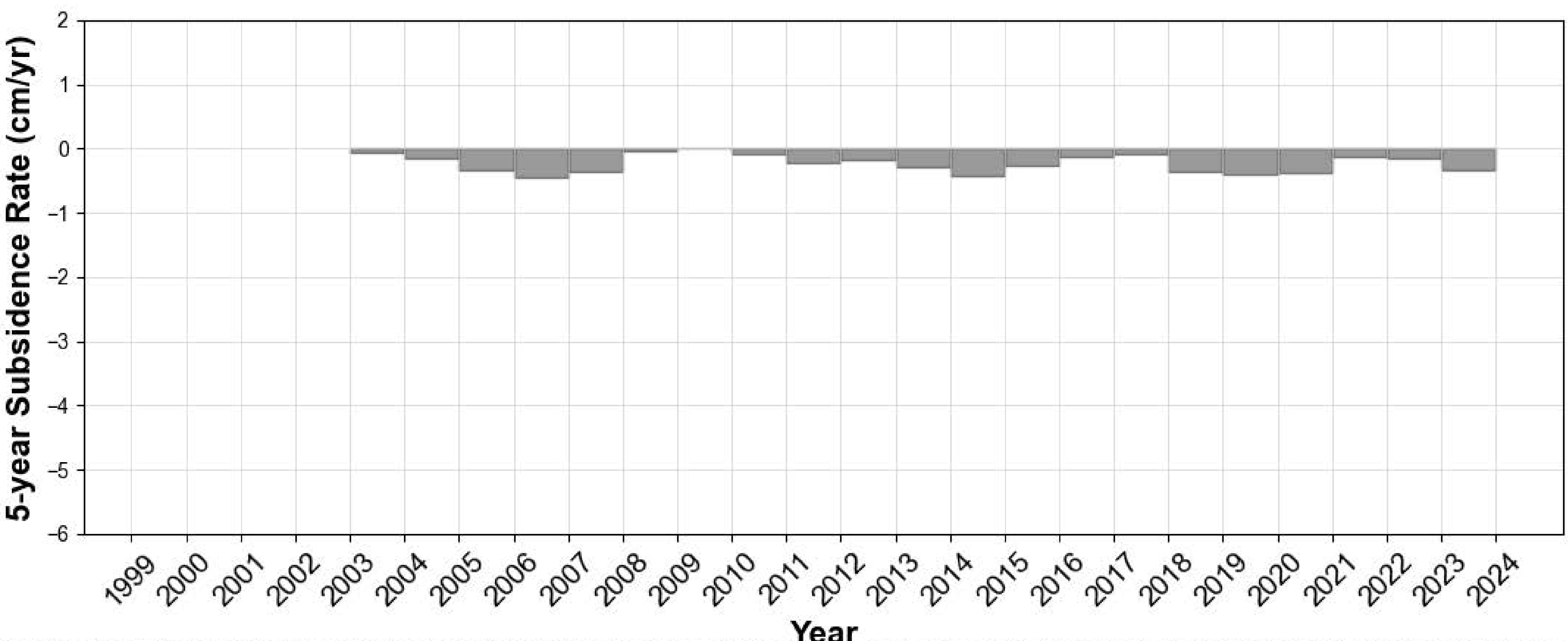


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P009

Huffman, TX

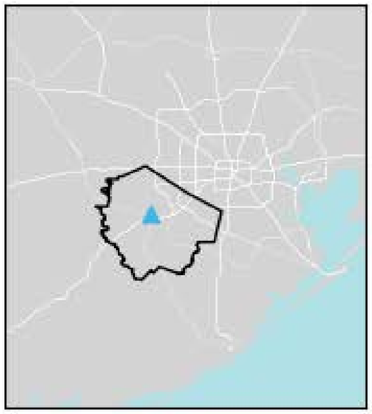


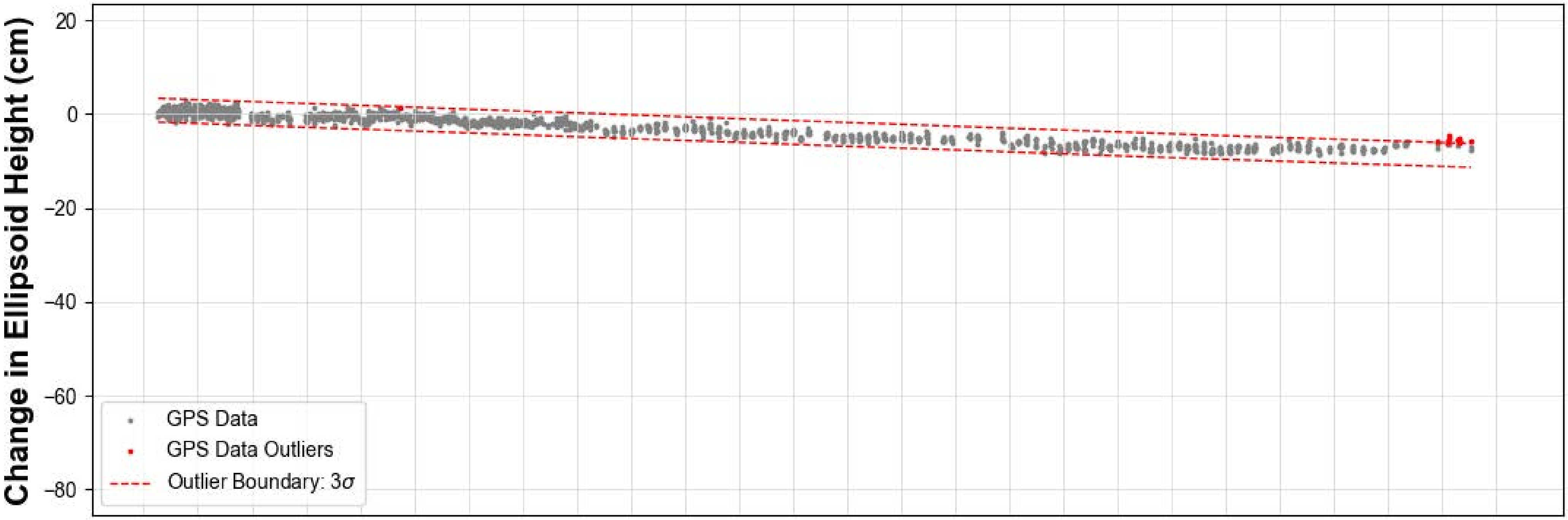


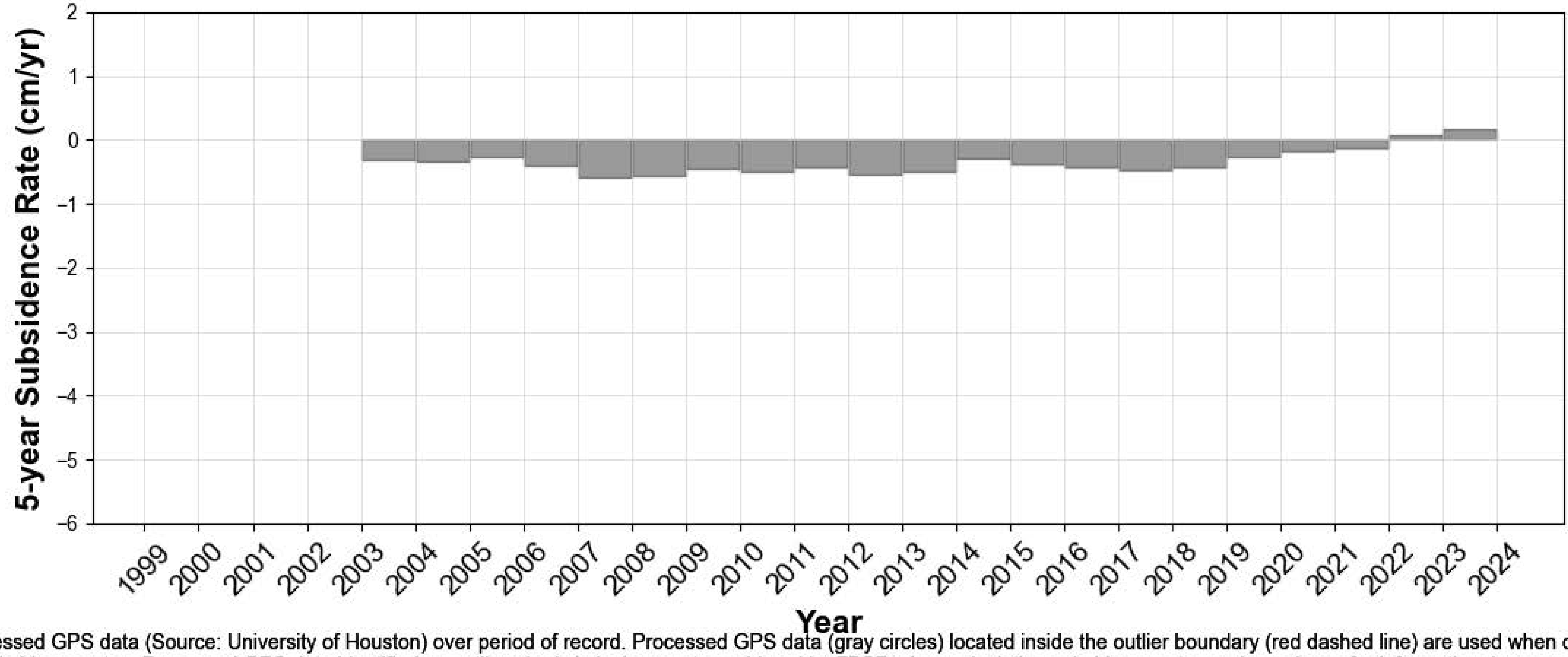
Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P010

Rosenberg, TX



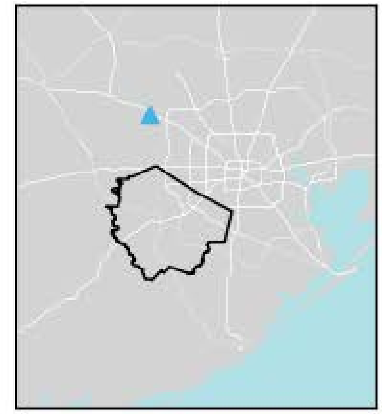


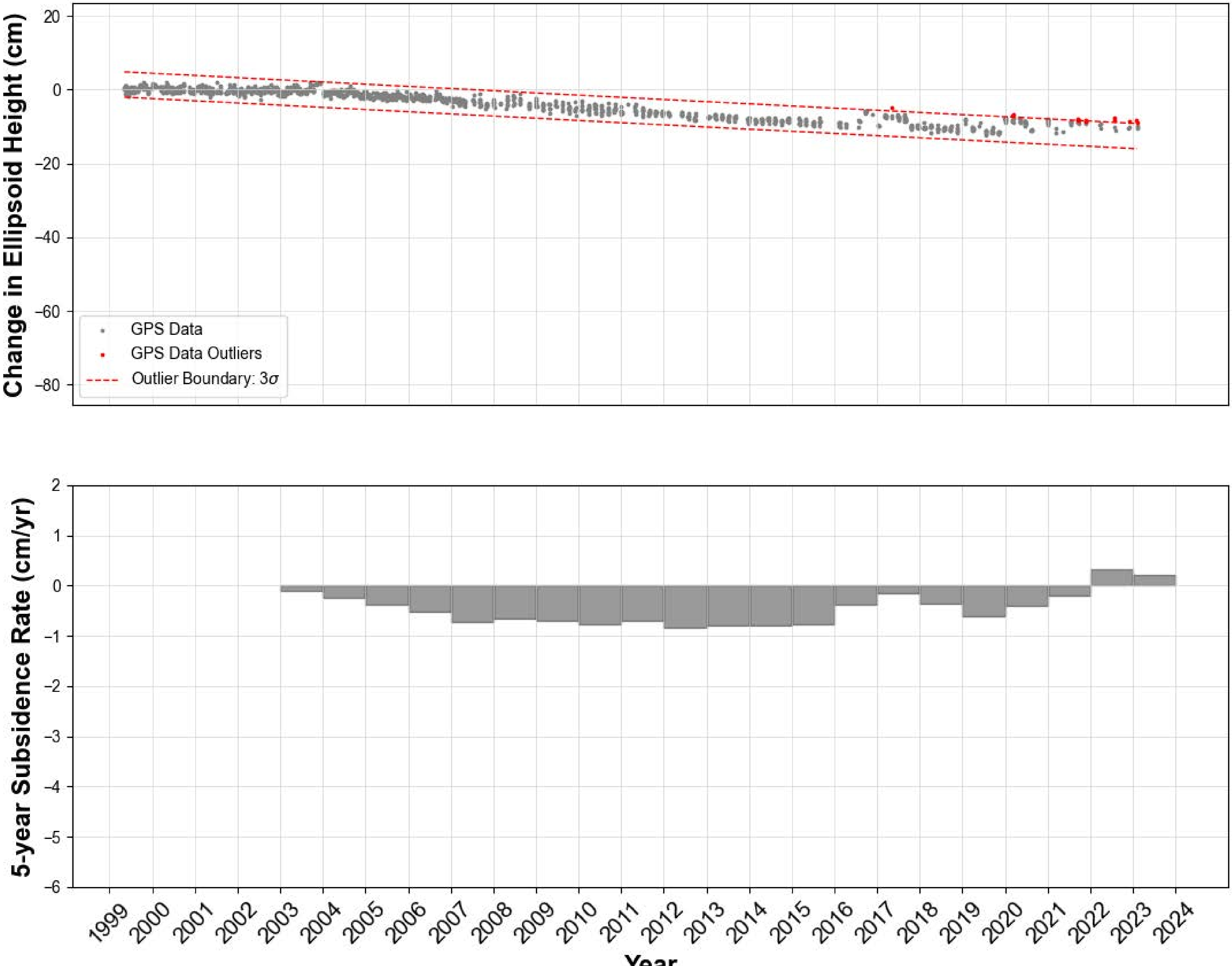


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P011

Hockley, TX

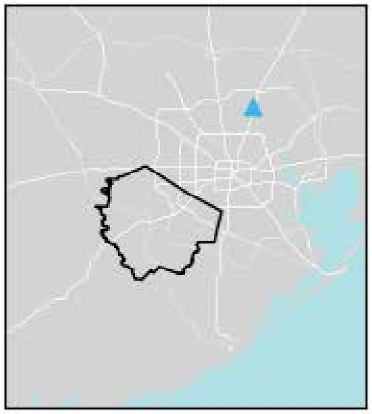


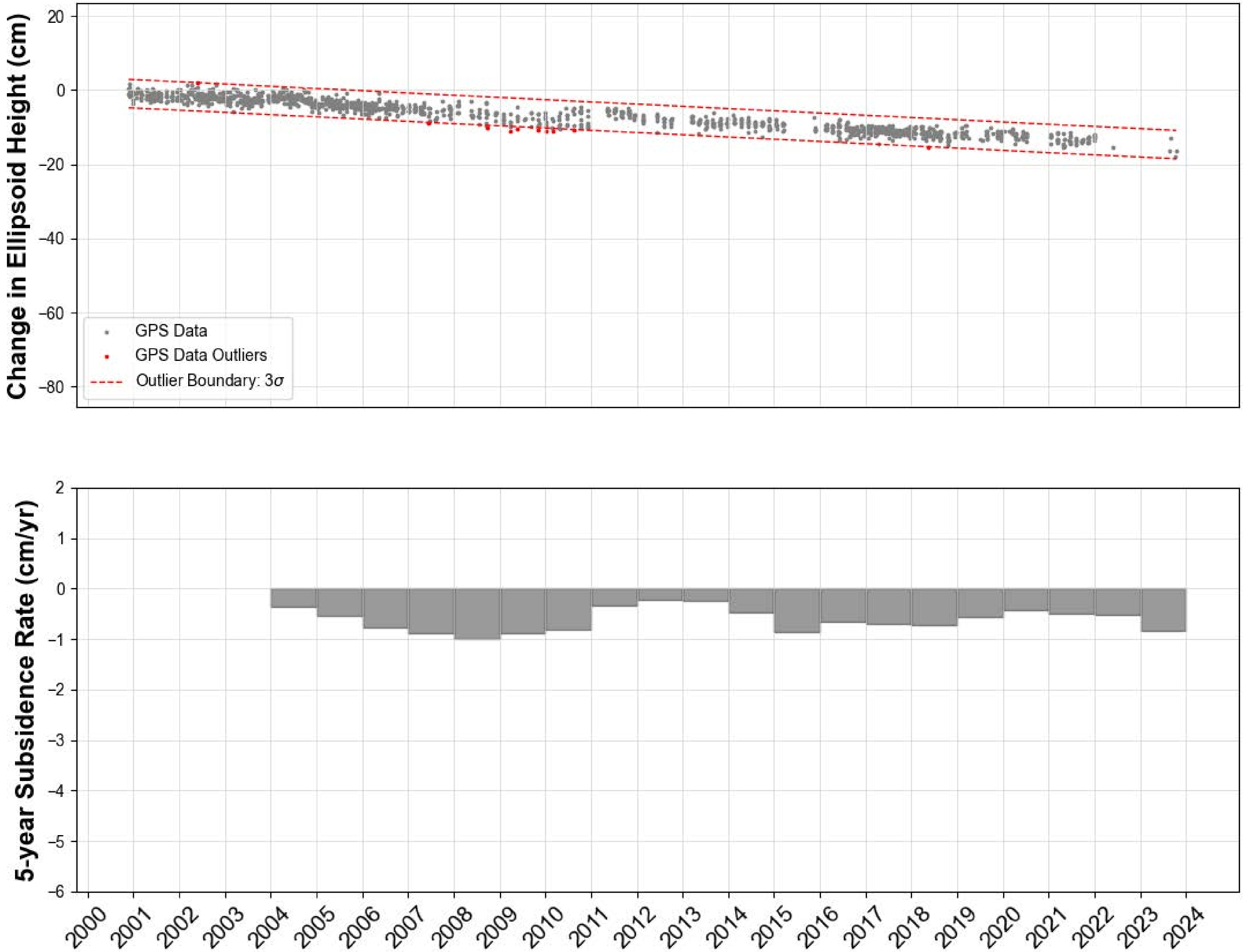


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P012

Porter, TX

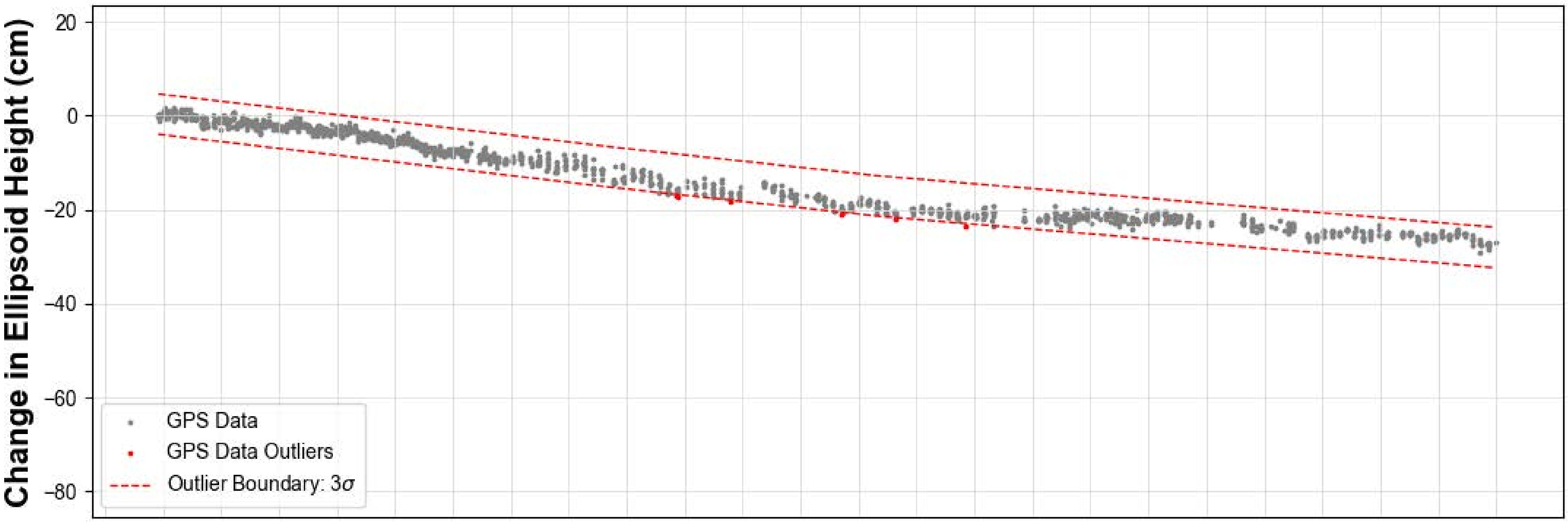


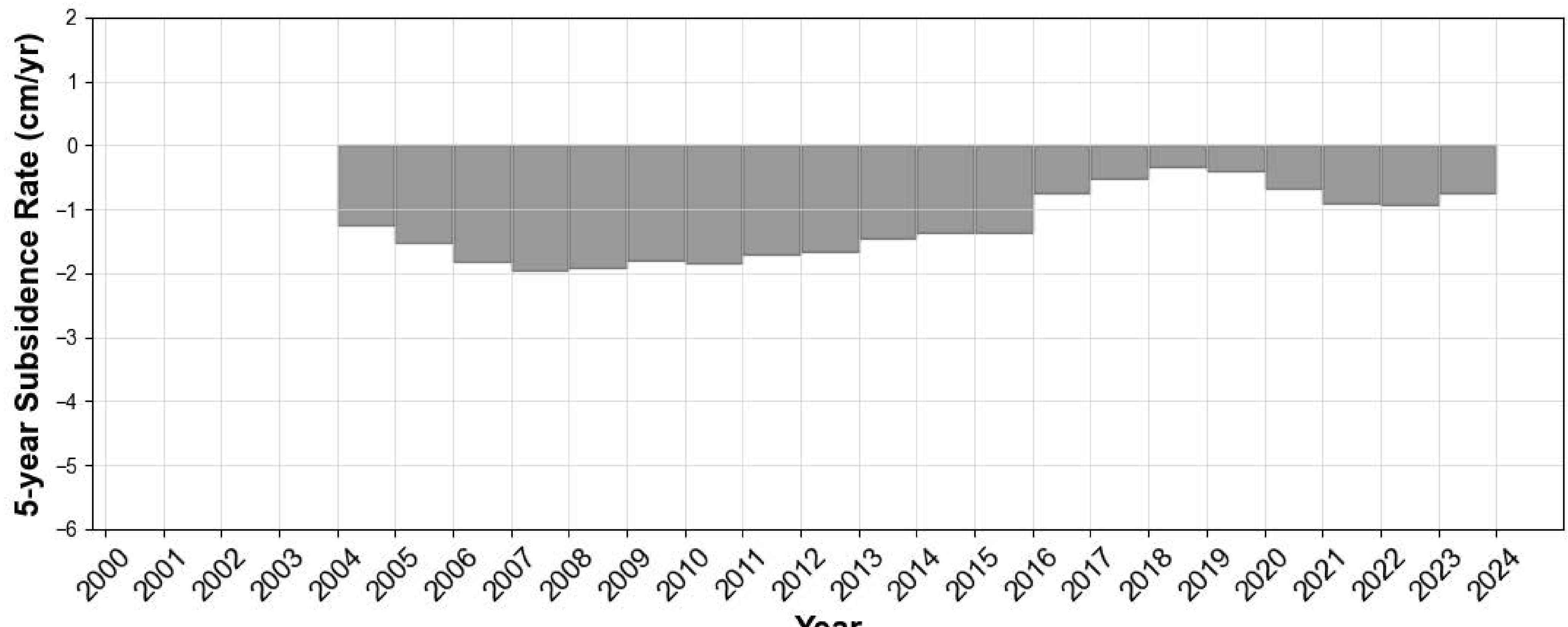


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P013

The Woodlands, TX

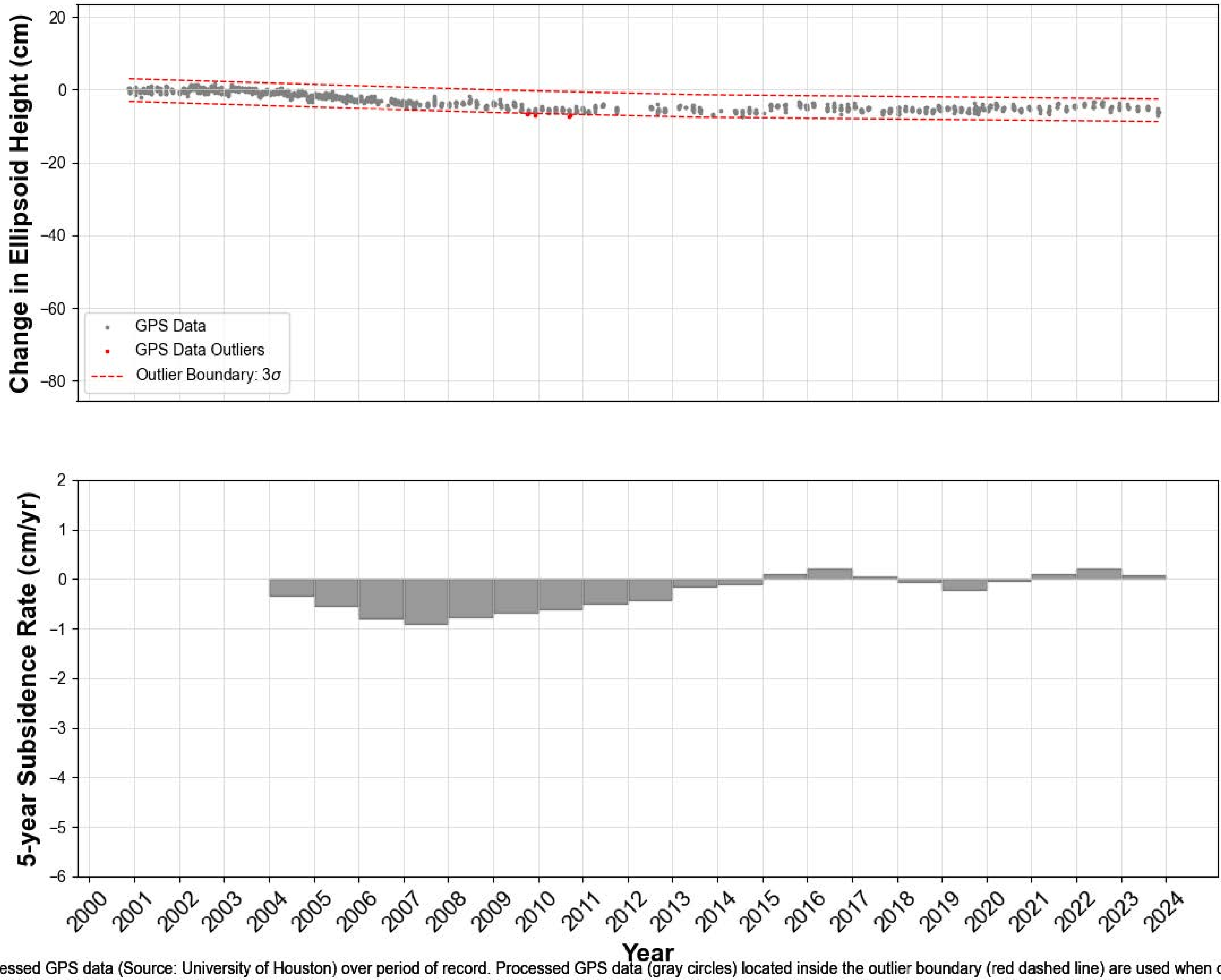




Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P014

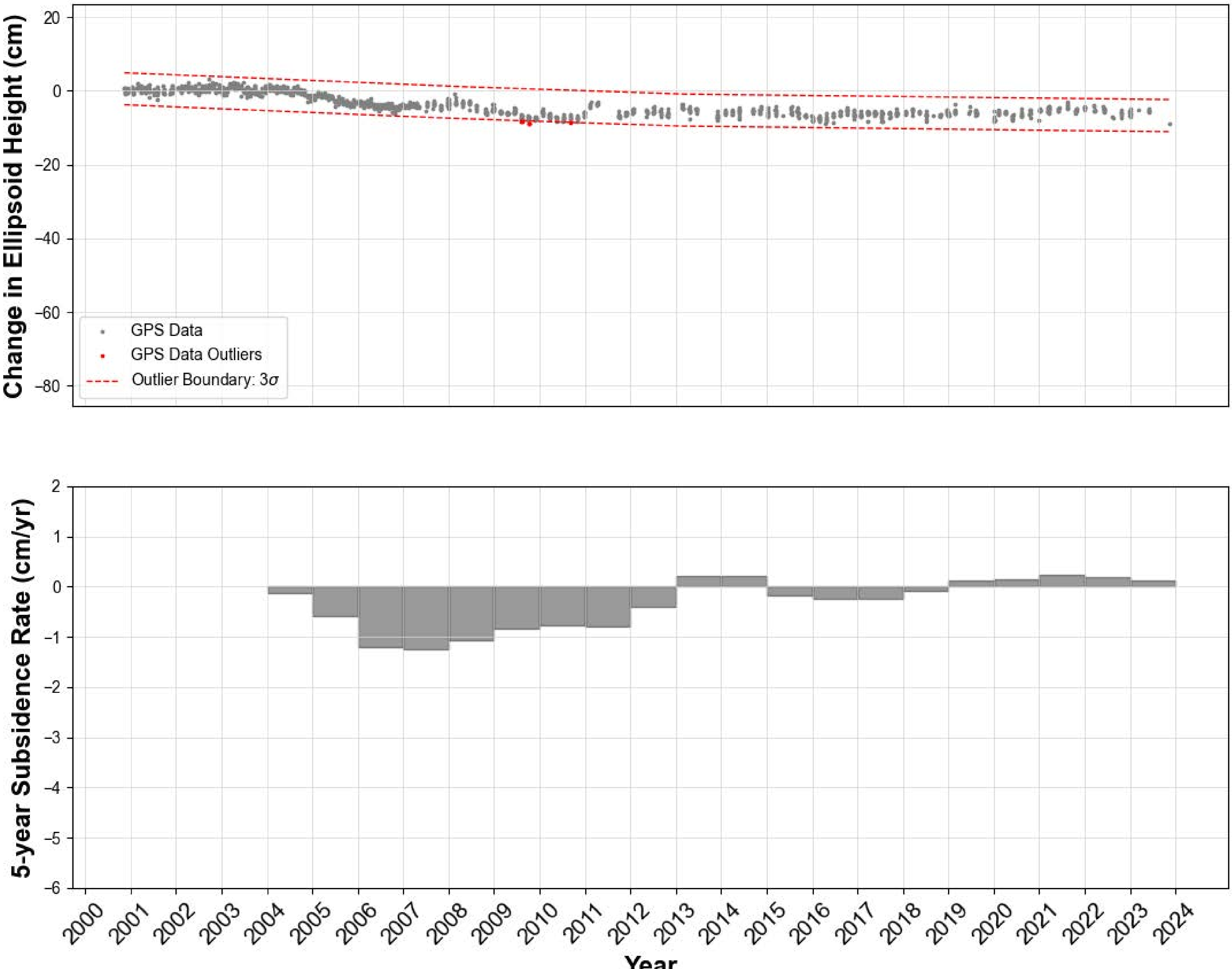
Thompsons, TX



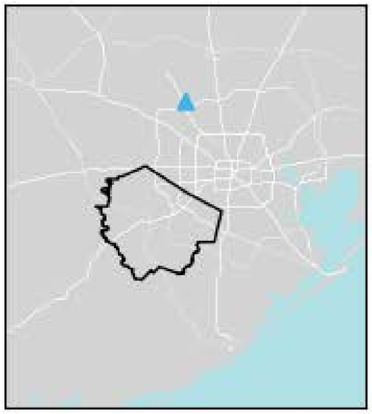
Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P016

Missouri City, TX

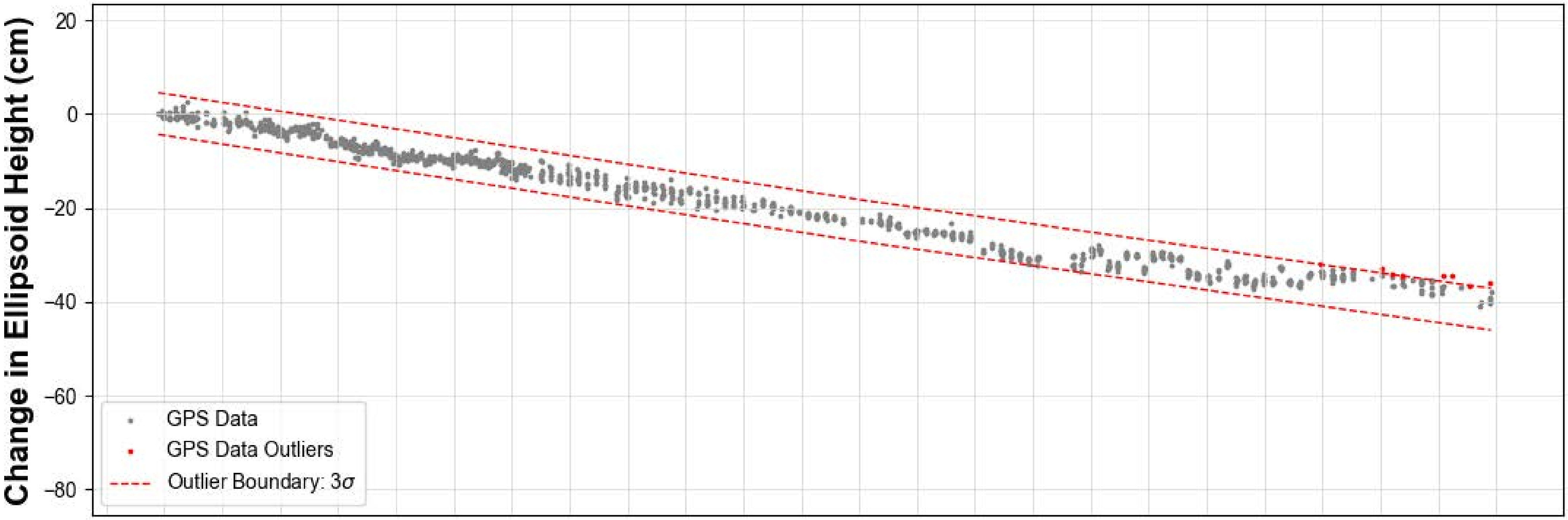


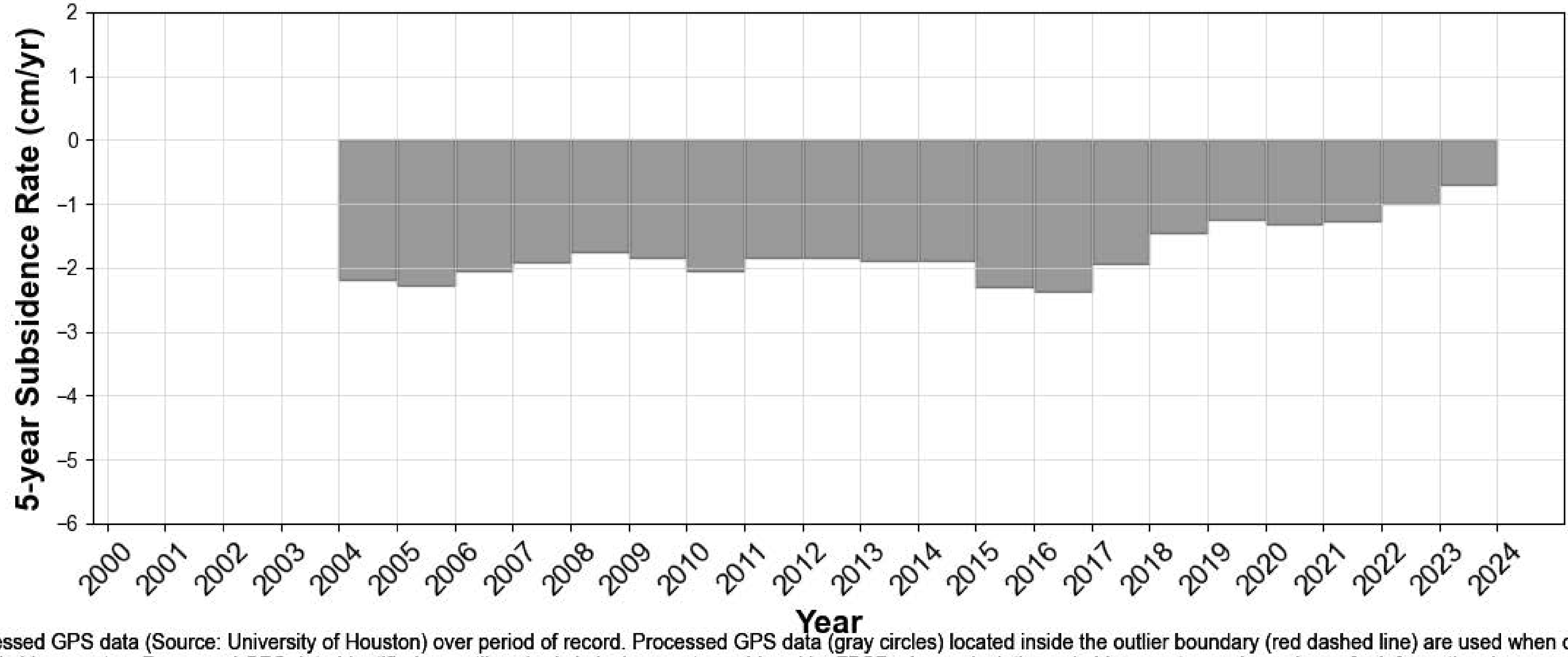
Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.



P017

Tomball, TX

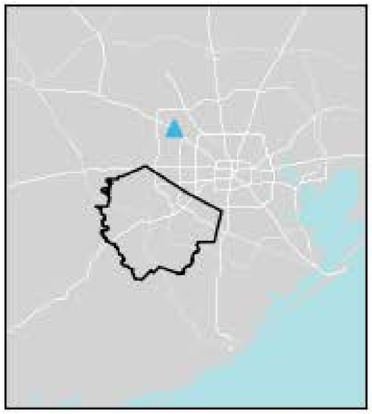


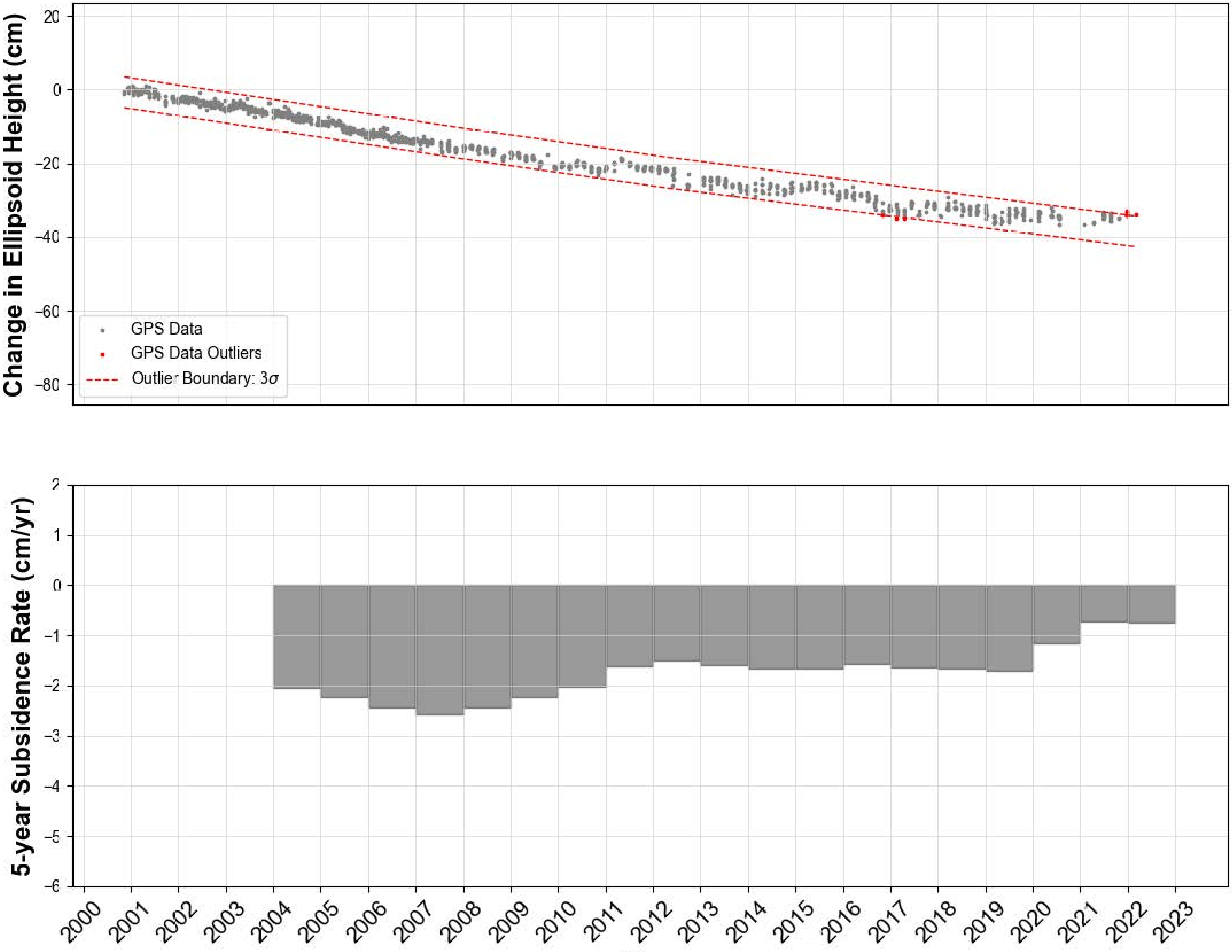


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P018

Cypress, TX

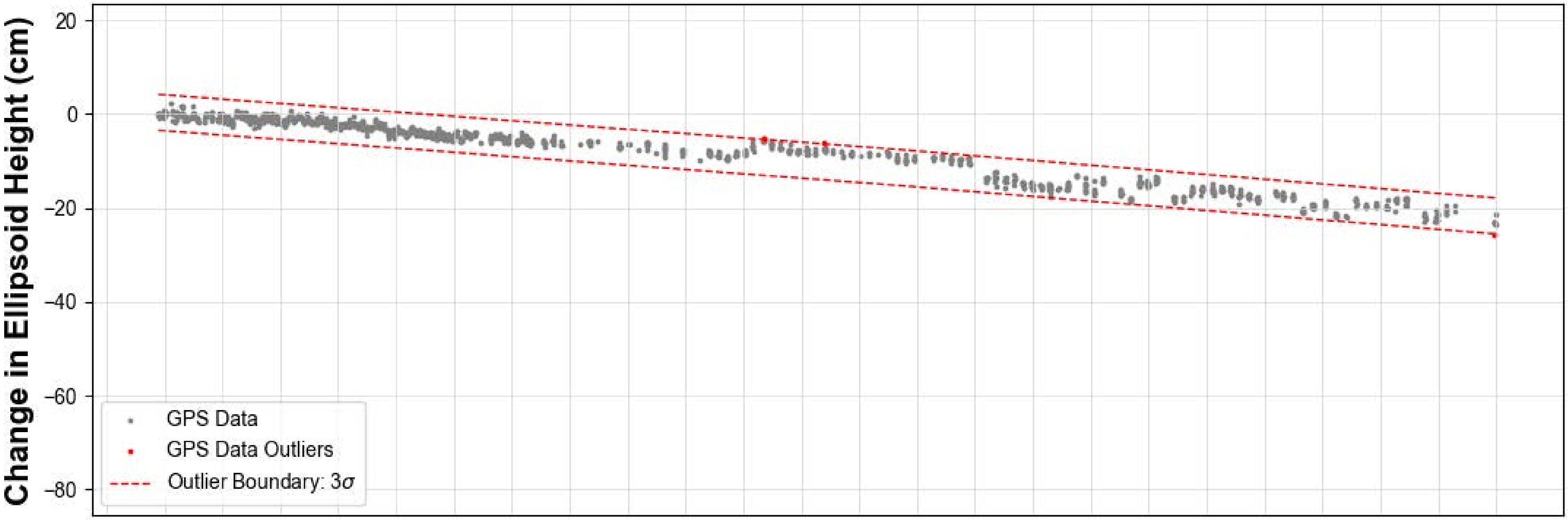


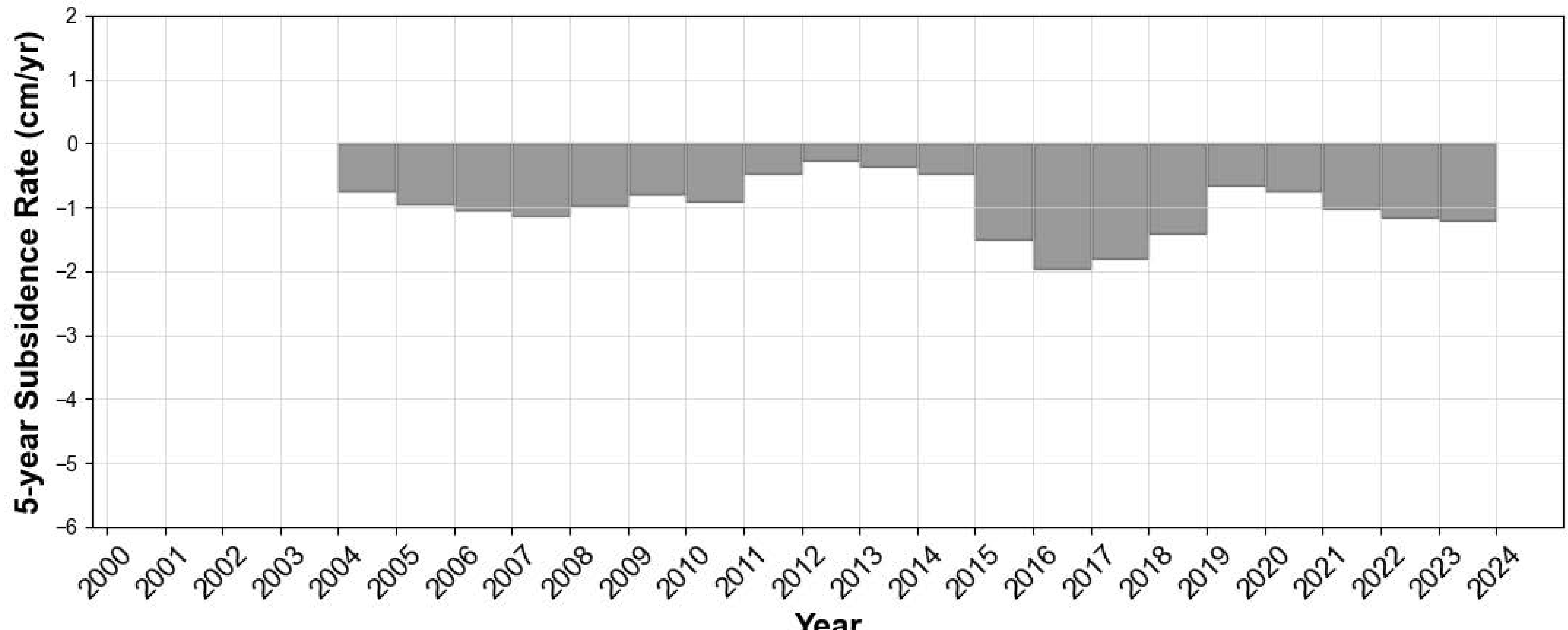


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P019

Katy, TX

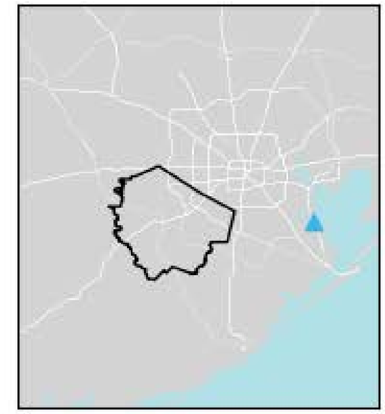


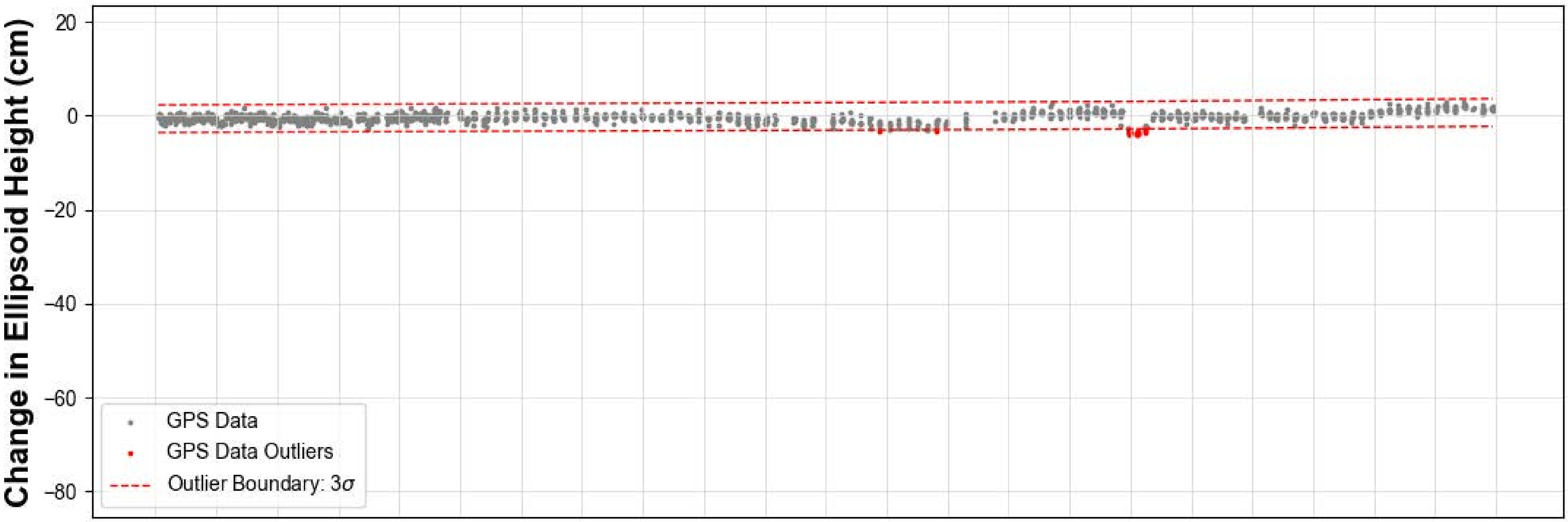


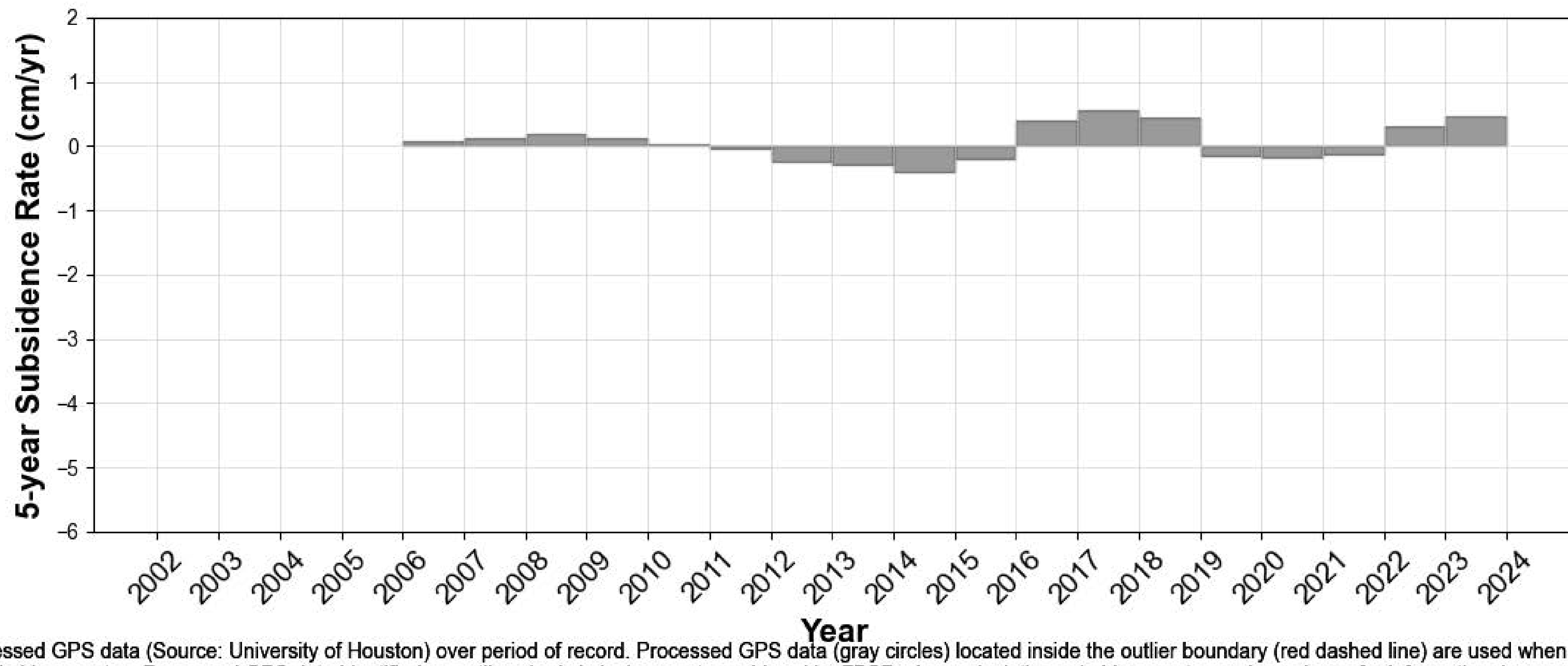
Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P020

Kemah, TX



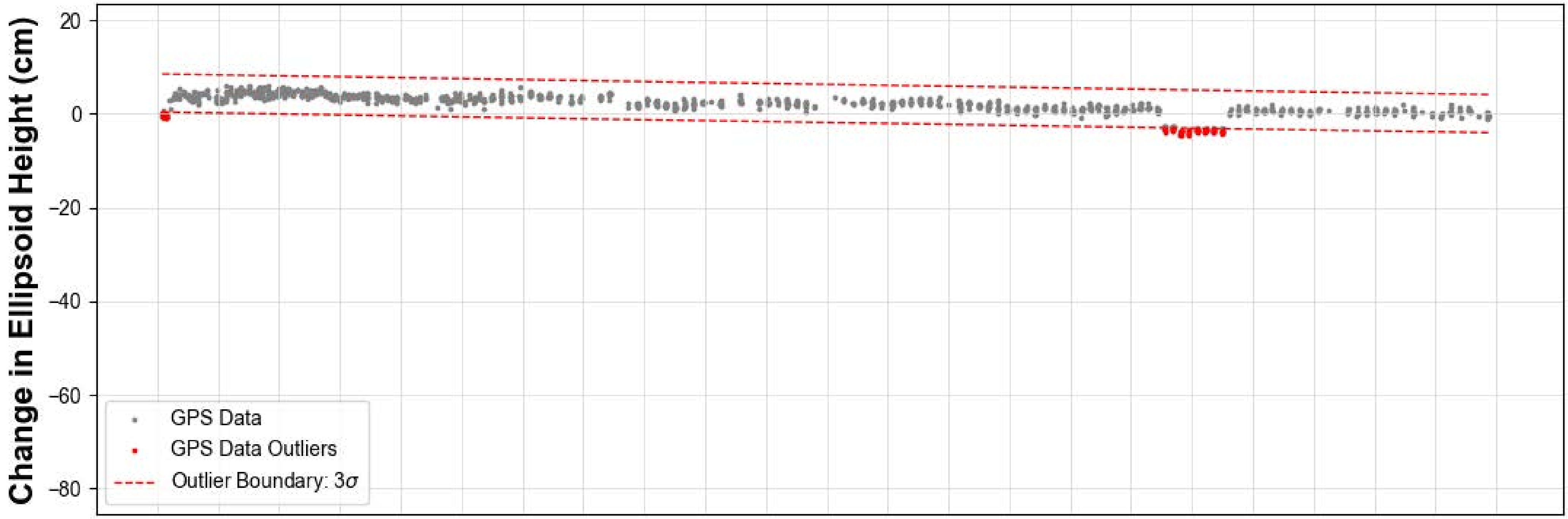


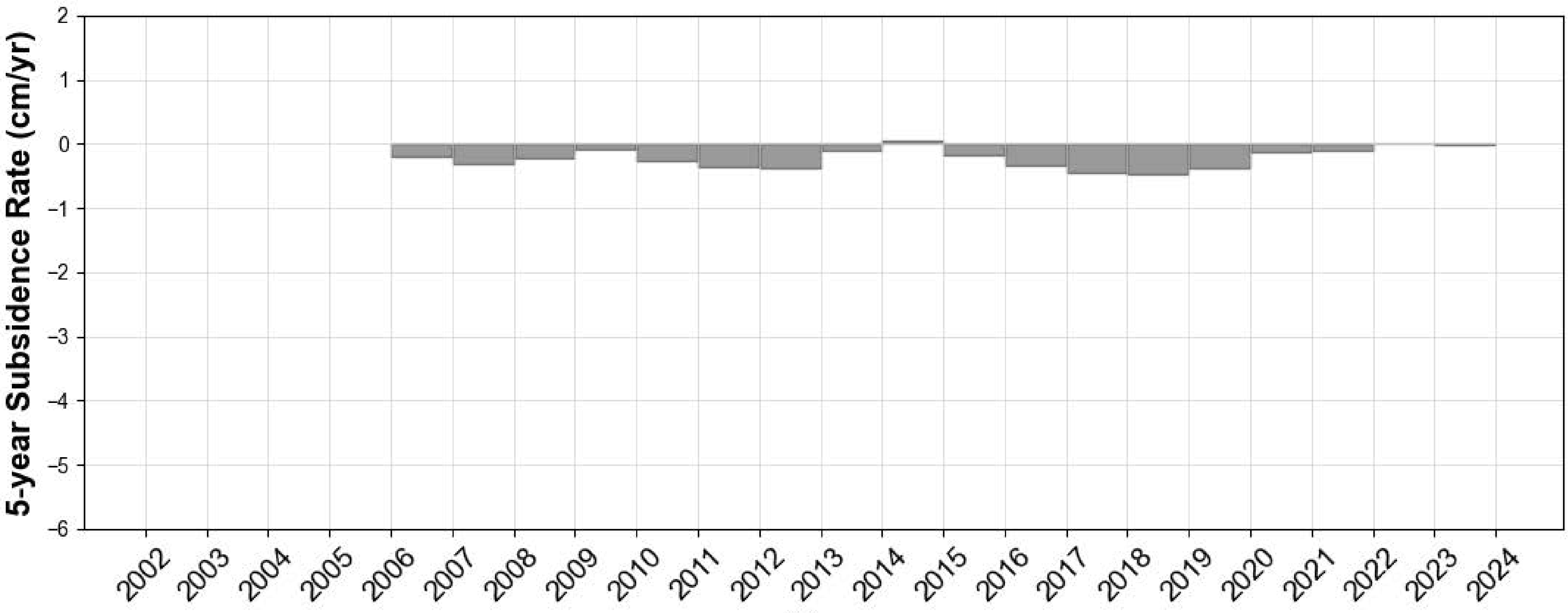


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P021

Pearland, TX

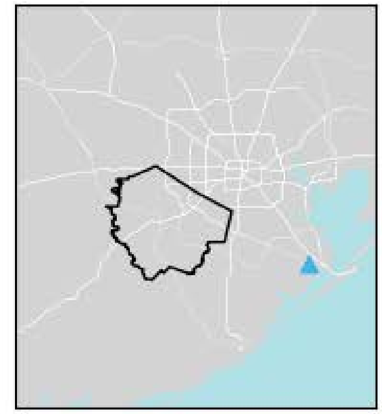


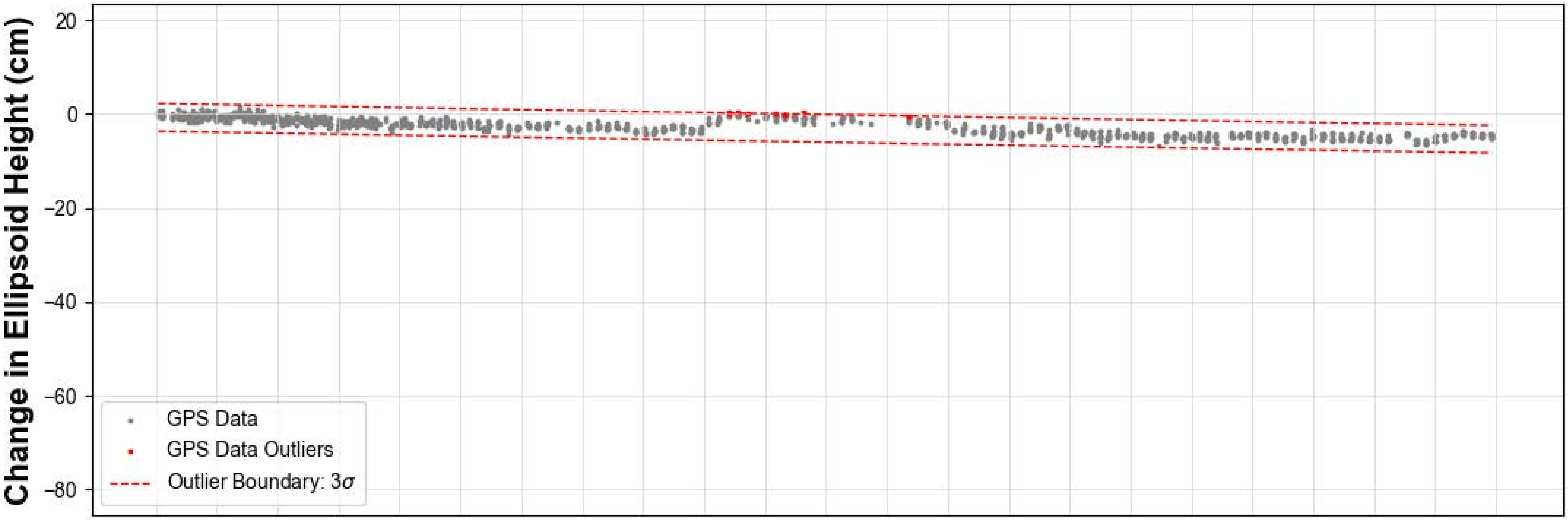


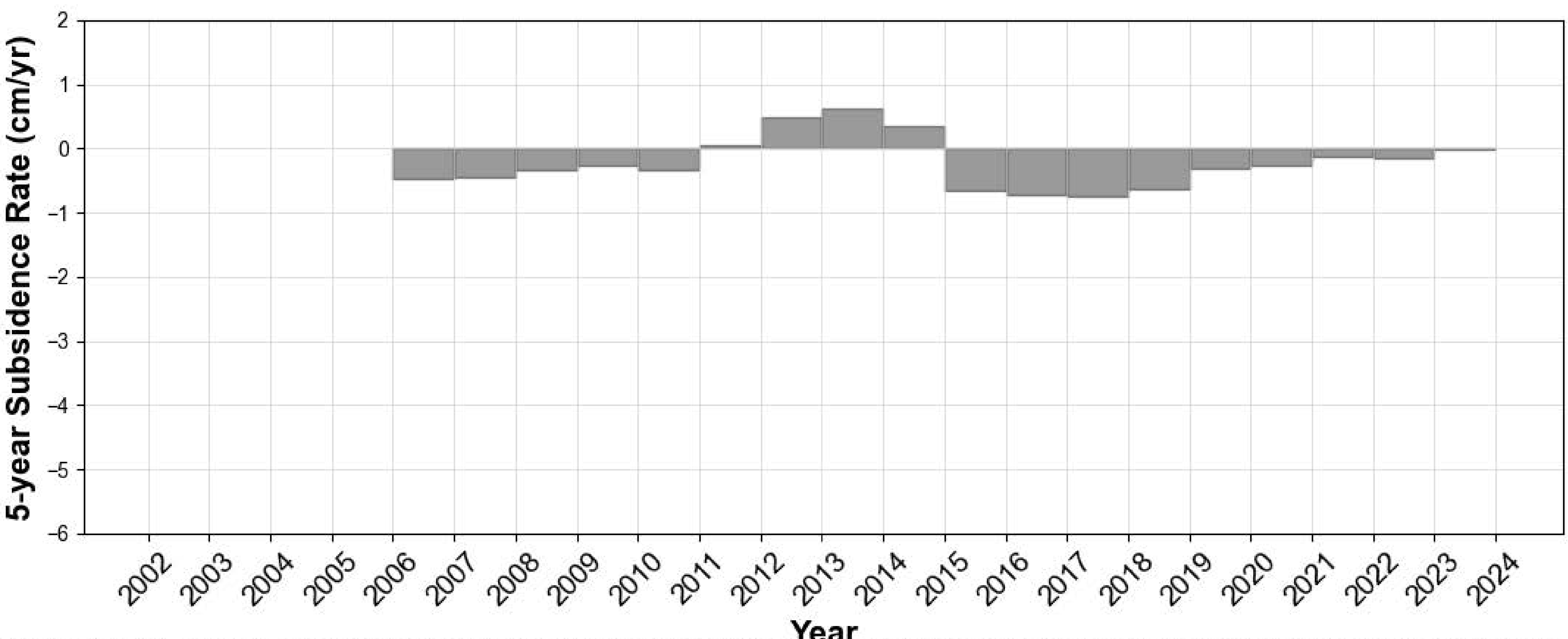
Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P022

Hitchcock, TX



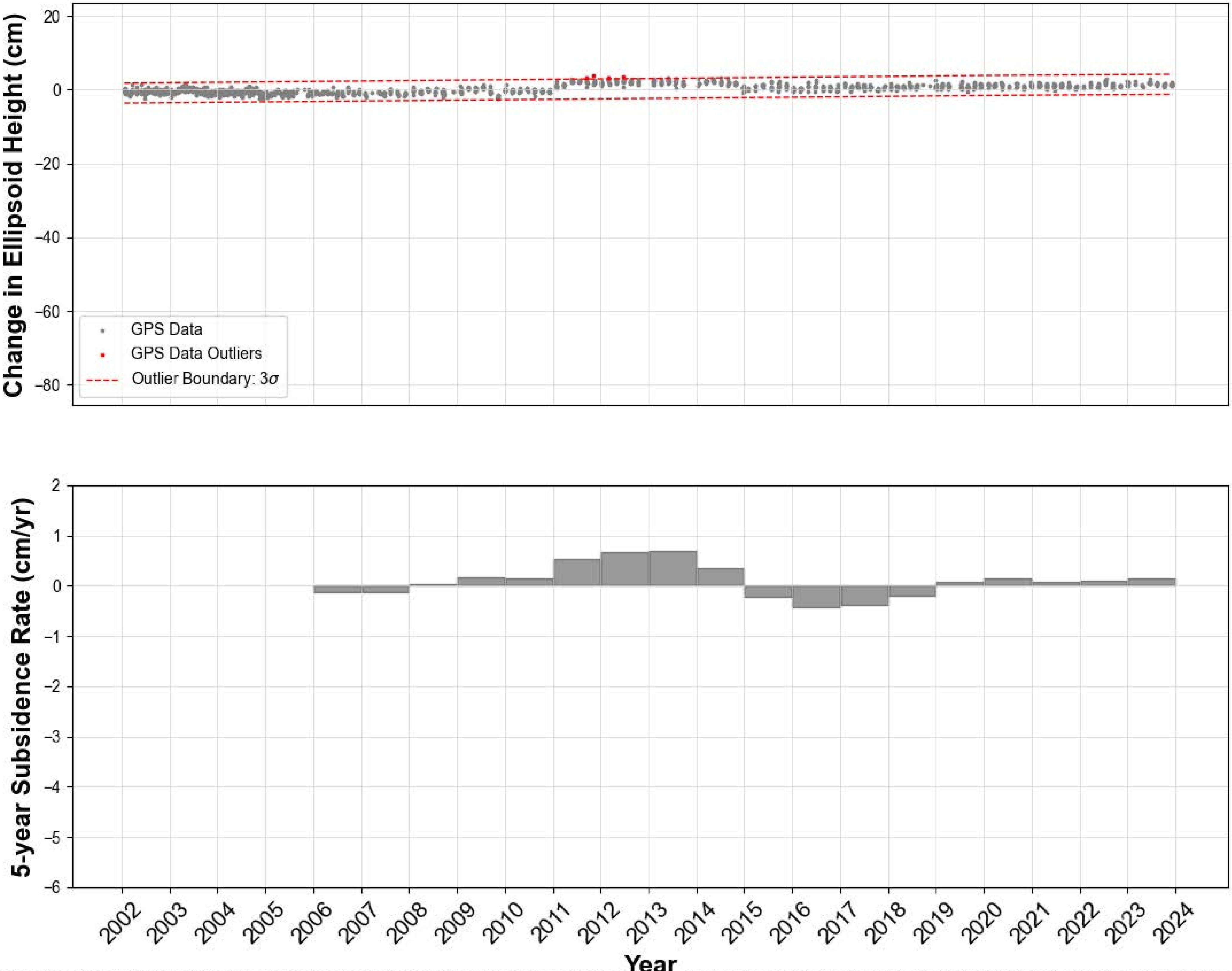




Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P023

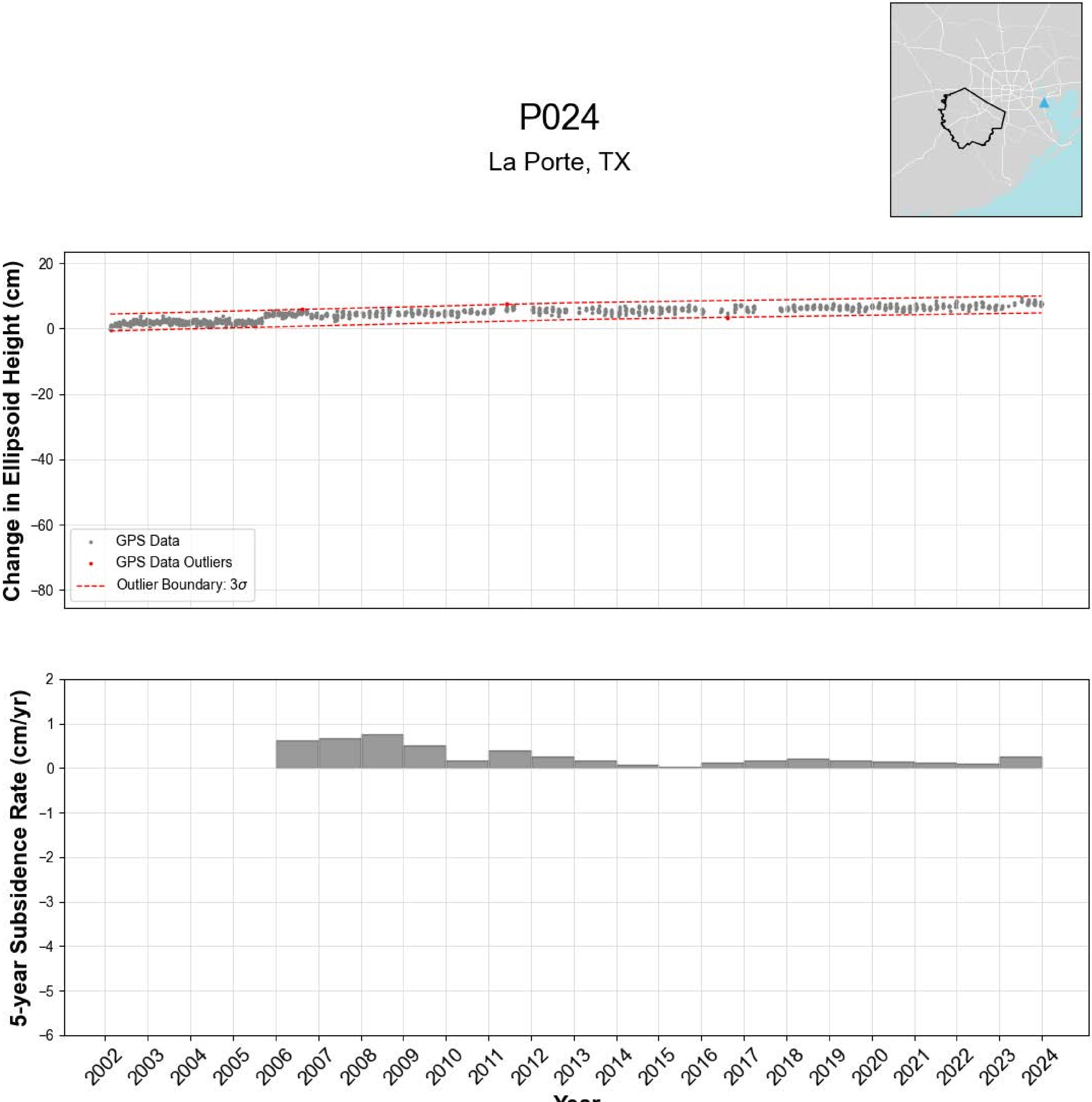
Texas City, TX



Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P024

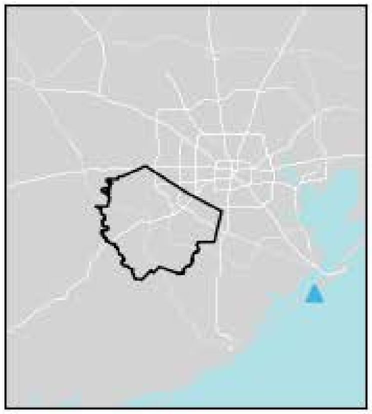
La Porte, TX

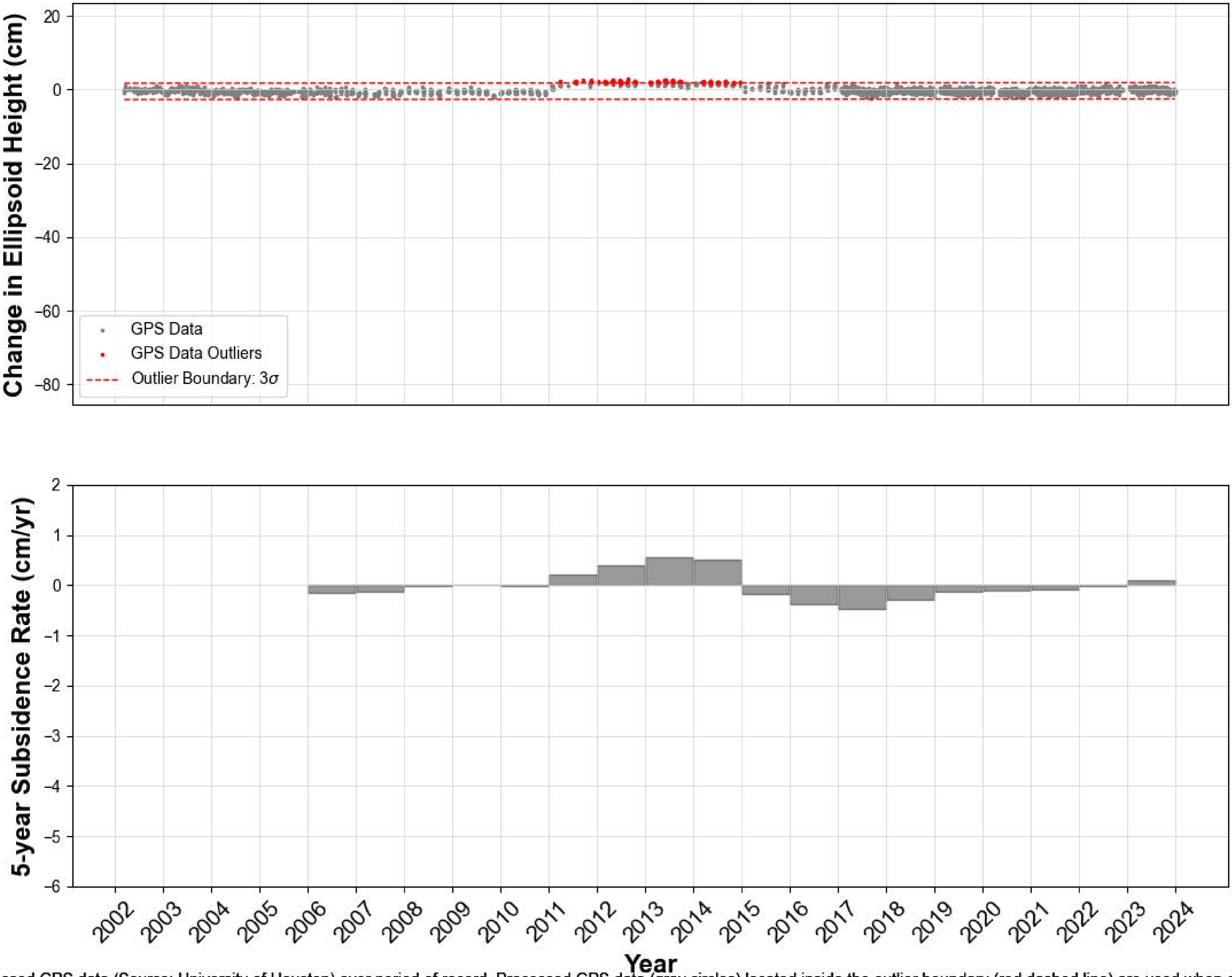


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P026

Galveston, TX

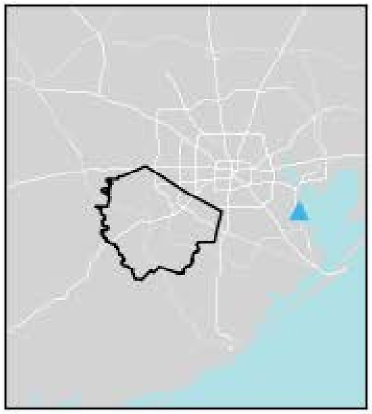


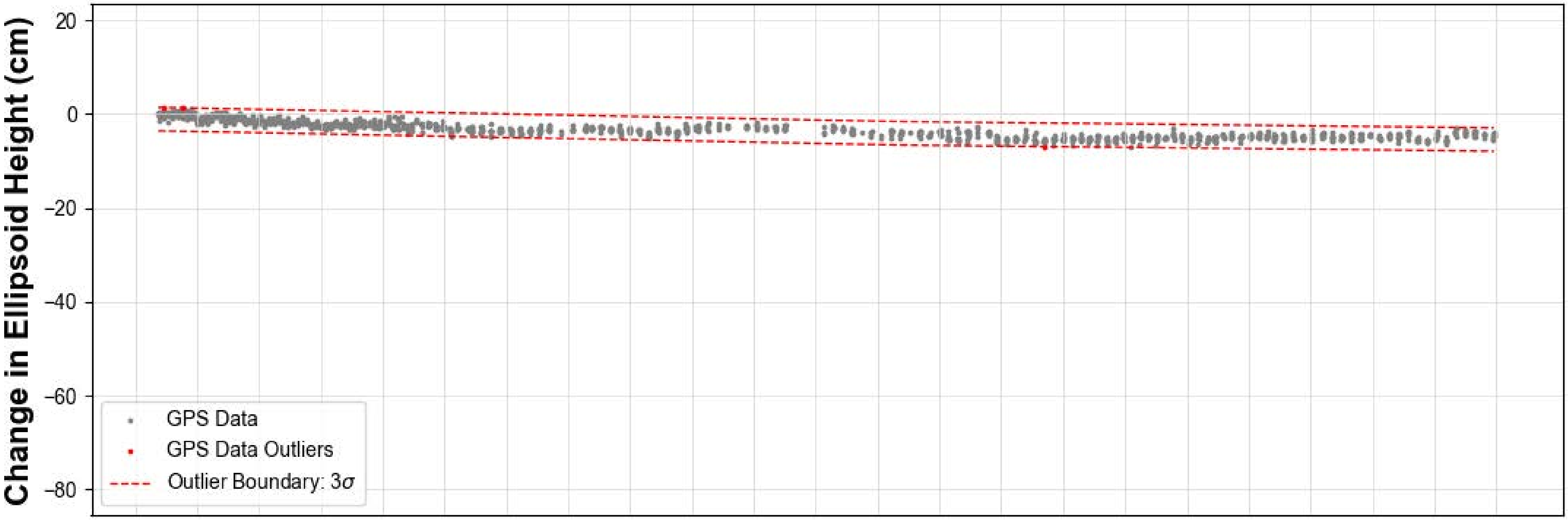


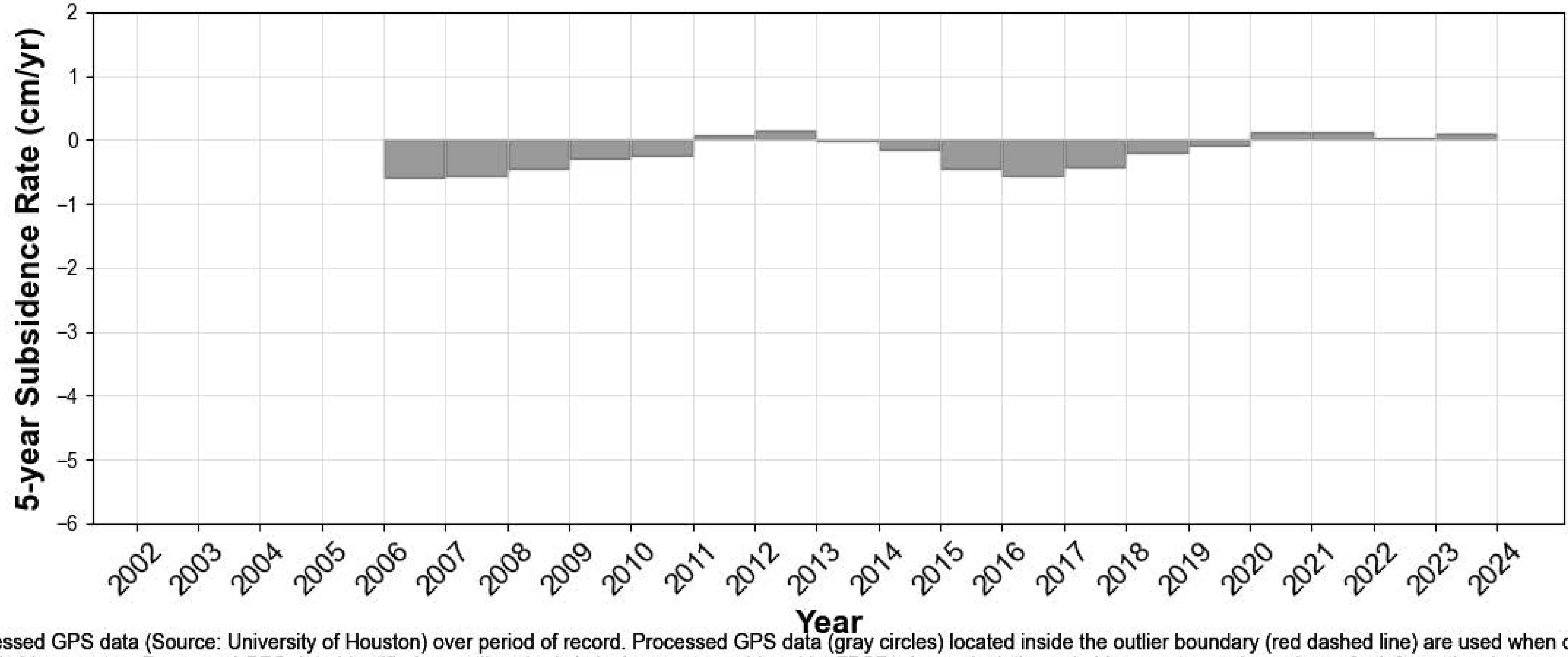
Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P027

Seabrook, TX



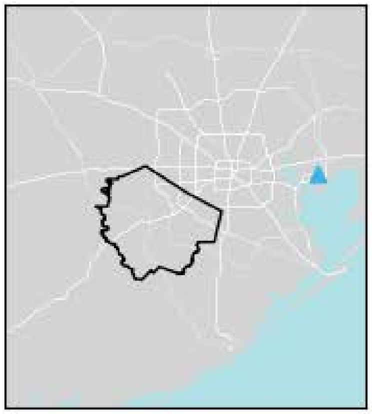


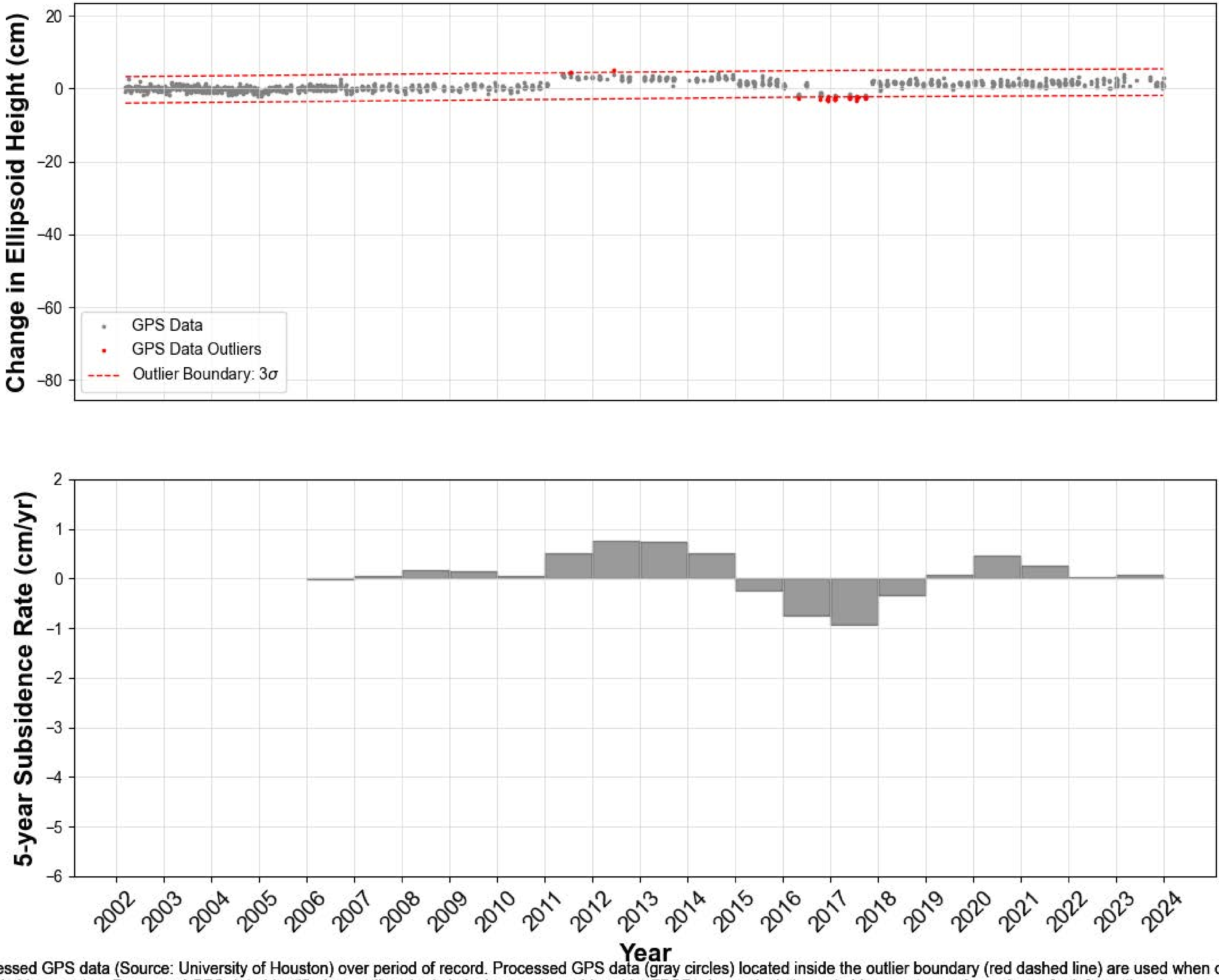


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P028

Baytown, TX

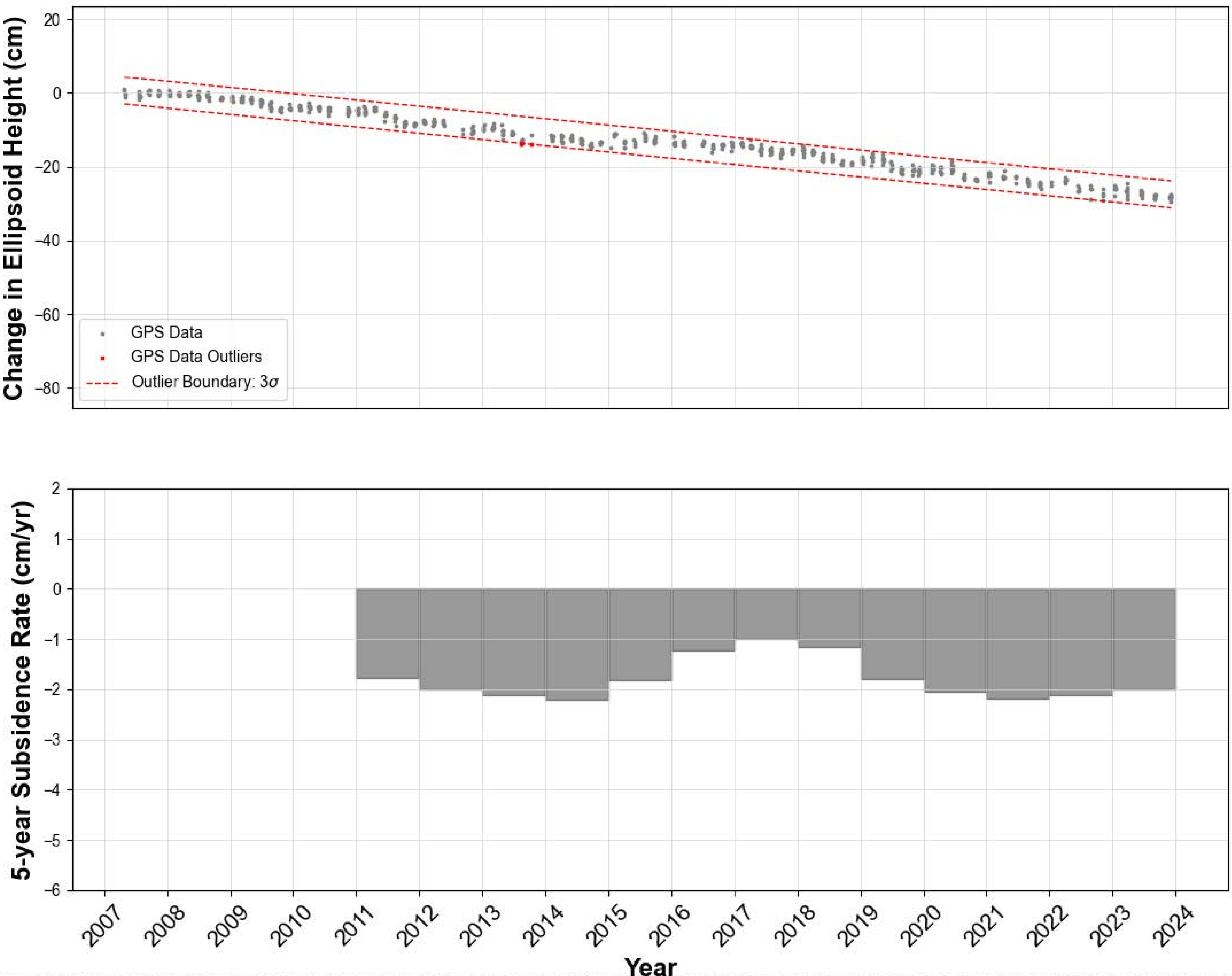




Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P029

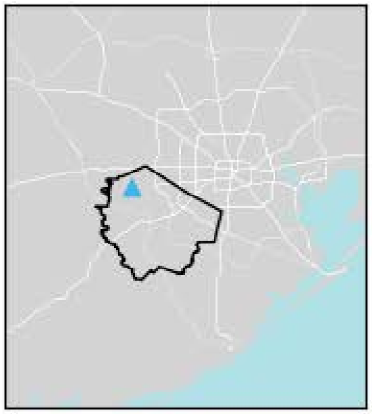
Katy, TX

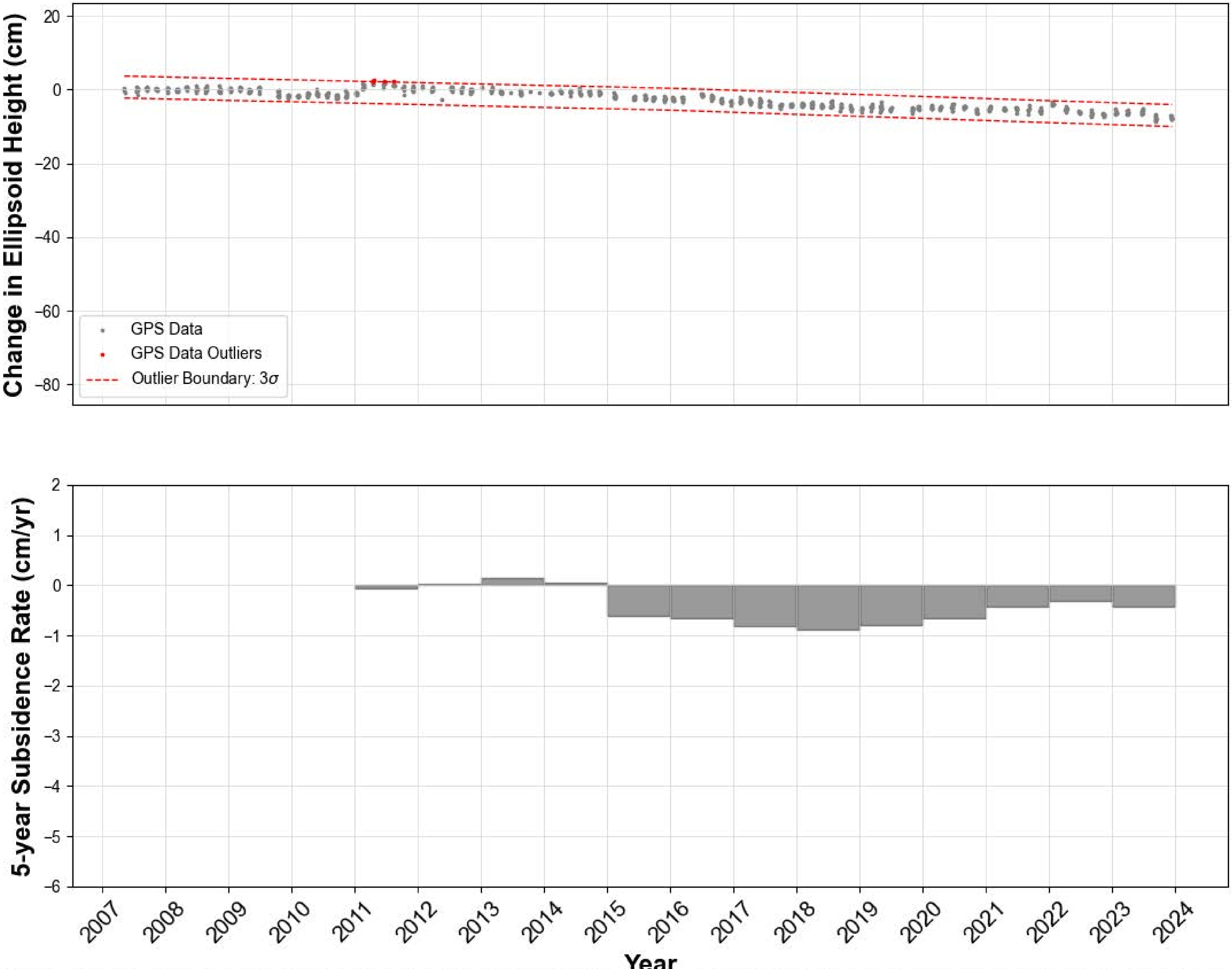


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P030

Fulshear, TX

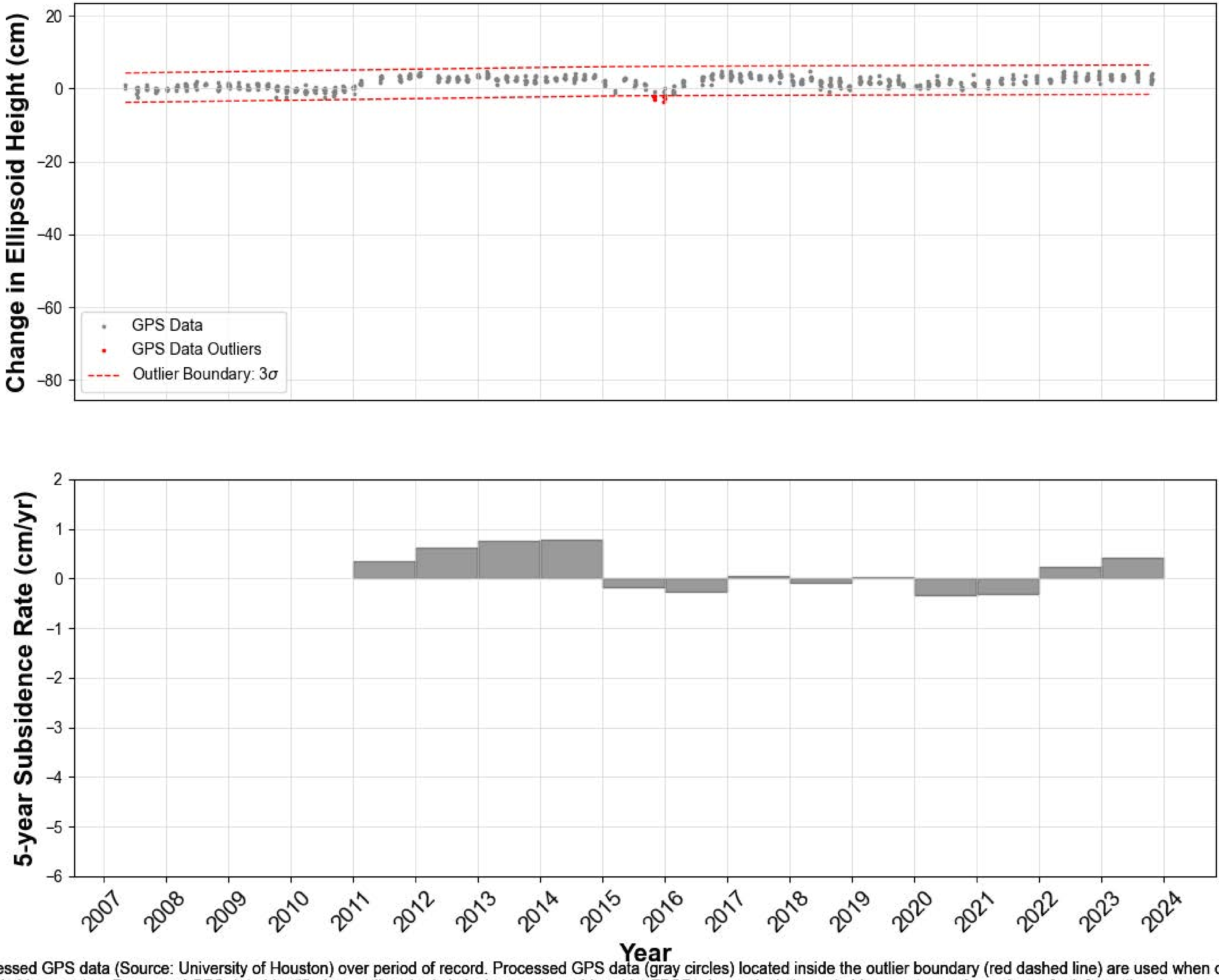




Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P031

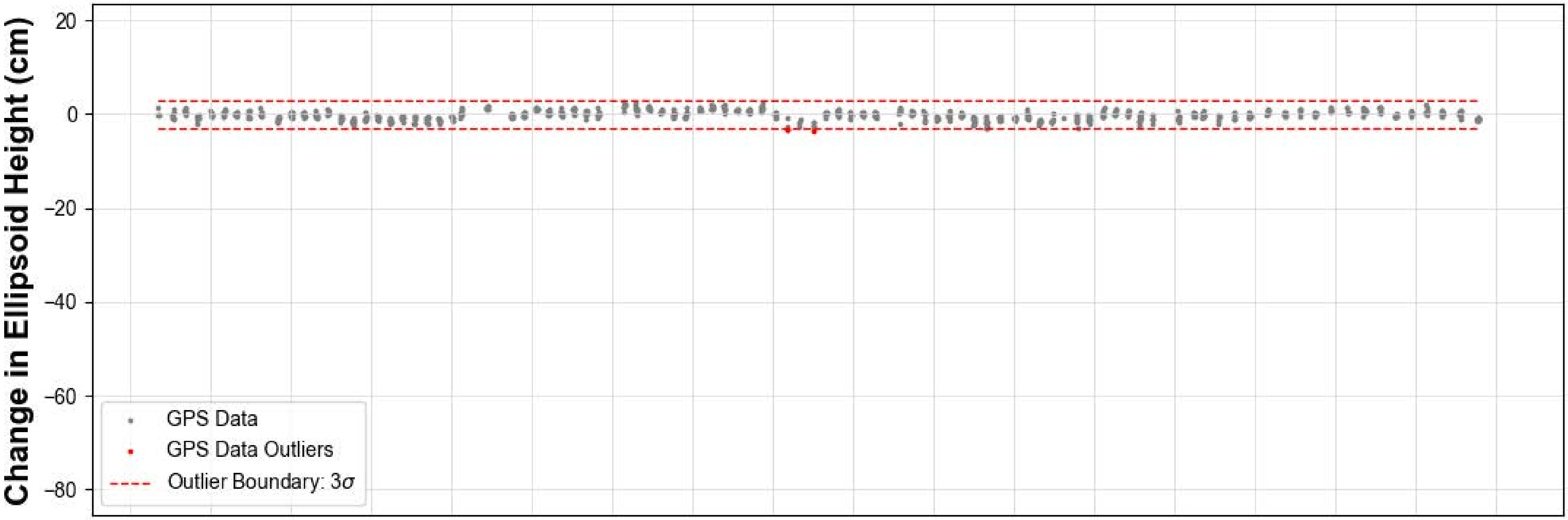
Needville, TX

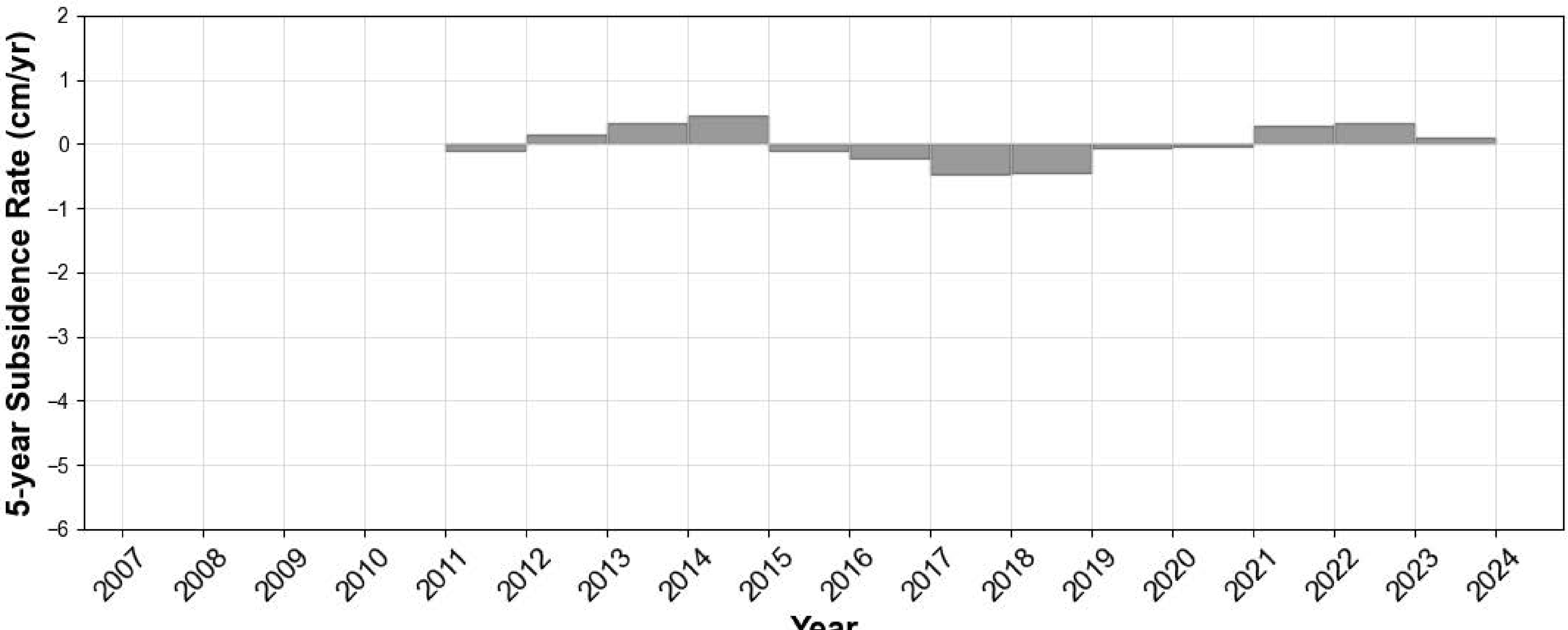


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P032

Richmond, TX

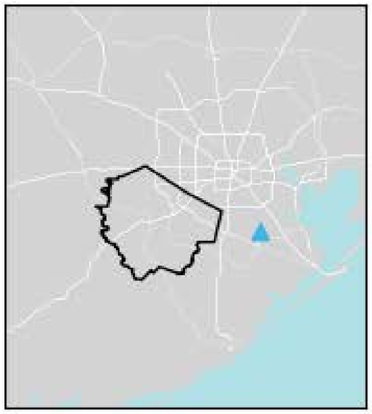


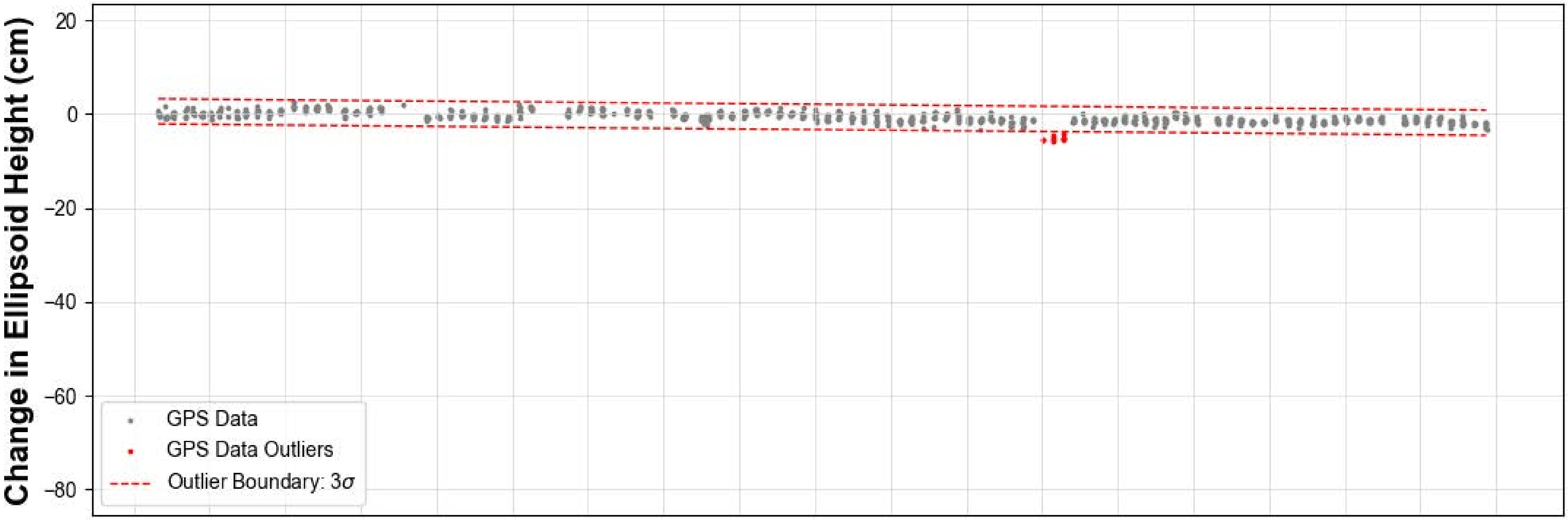


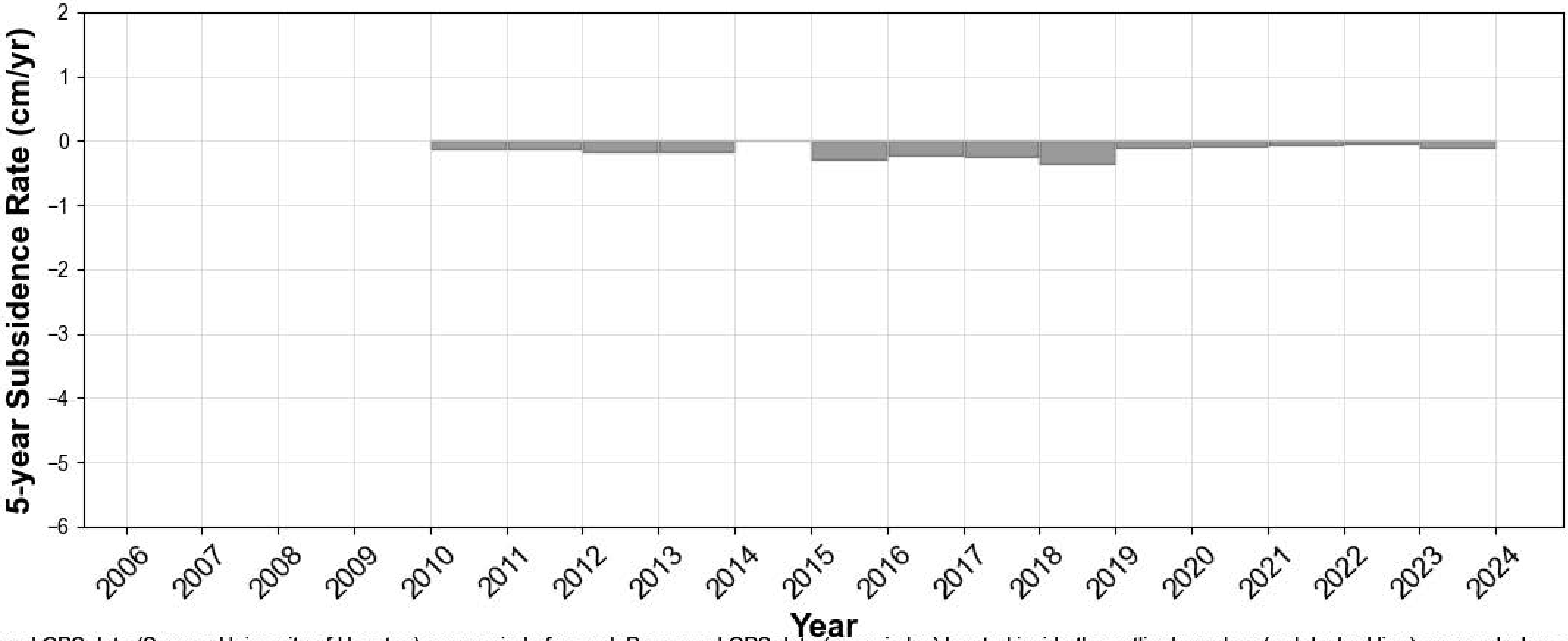
Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P033

Friendswood, TX



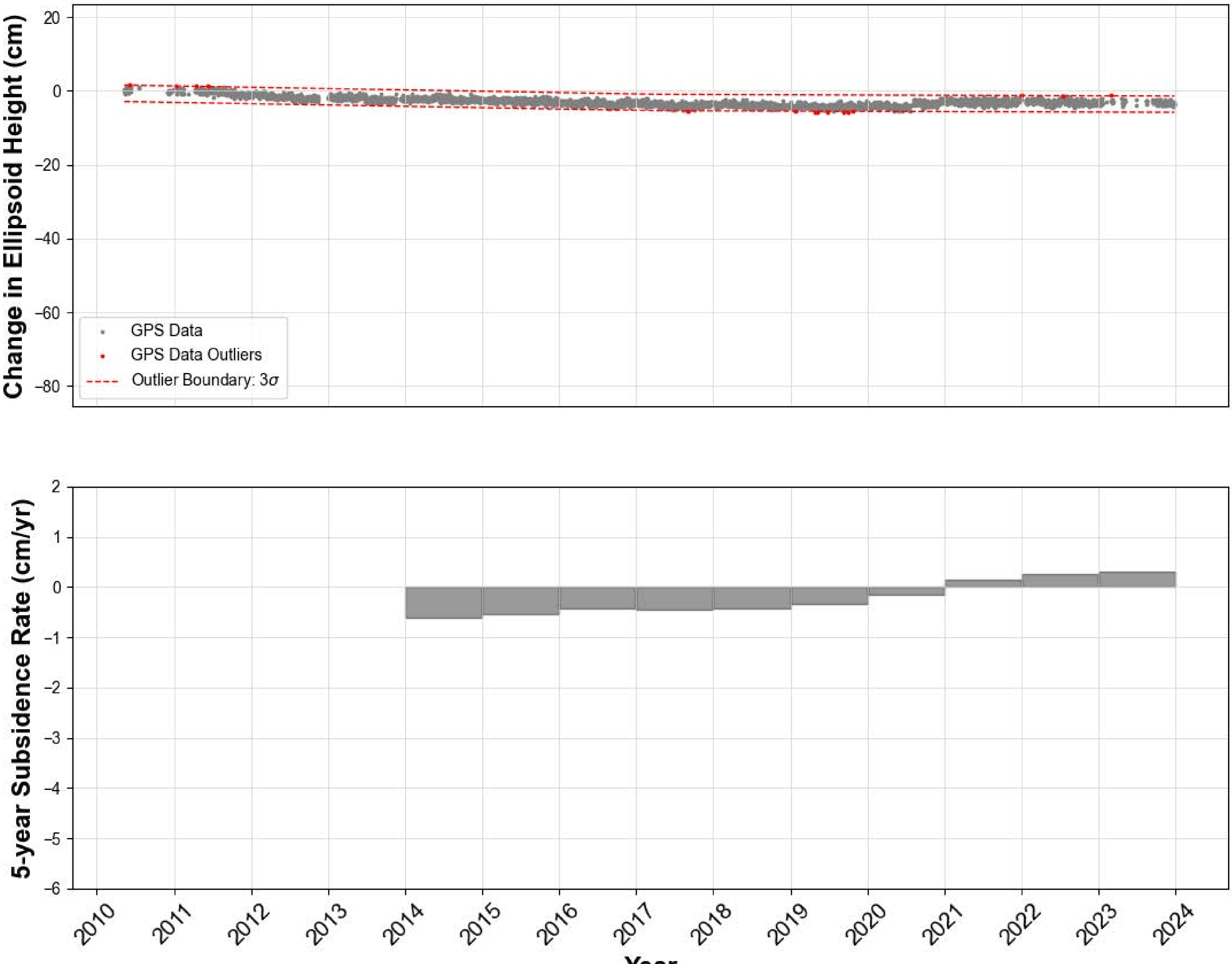




Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P034

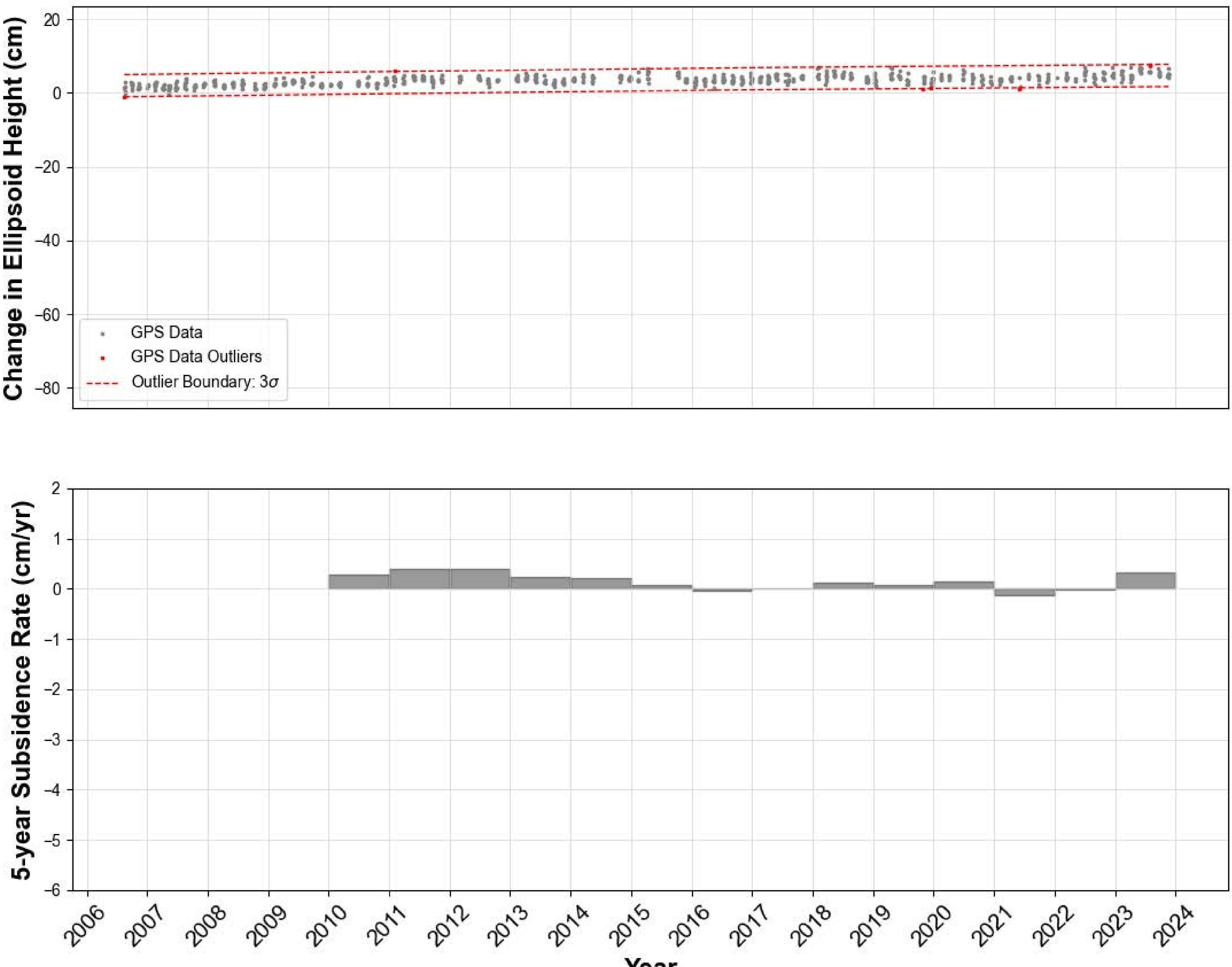
Texas City, TX



Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P035

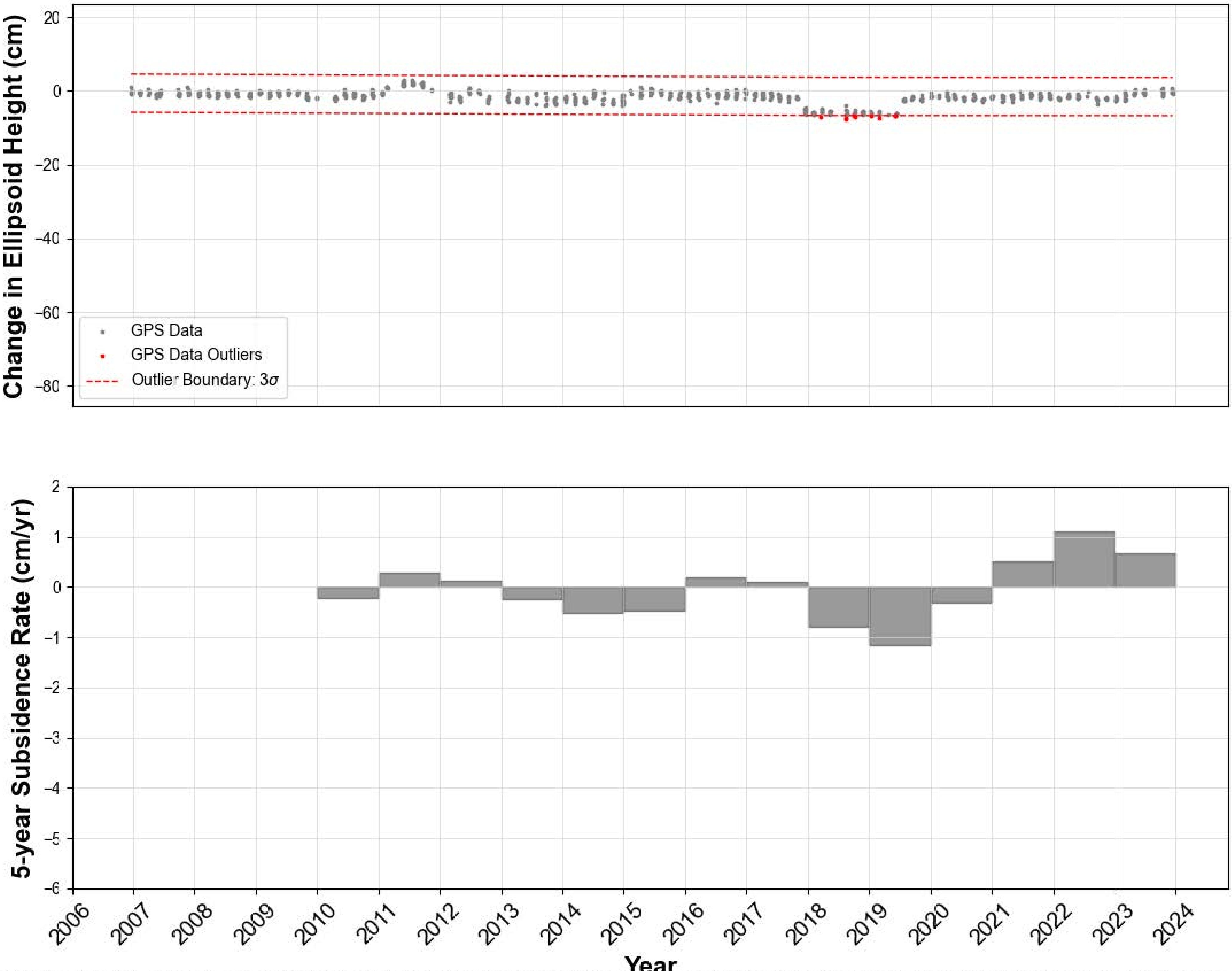
League City, TX



Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P036

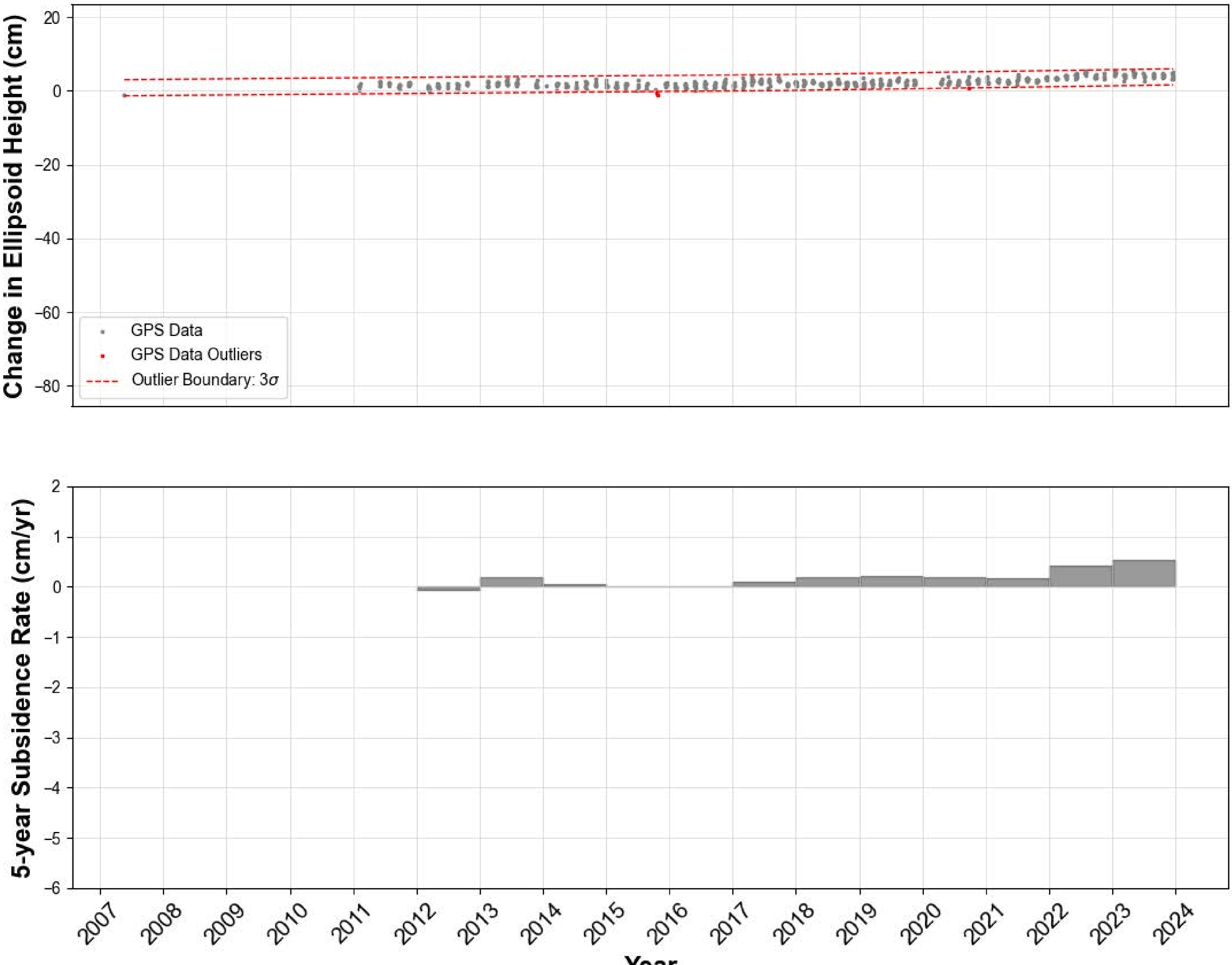
San Leon, TX



Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P037

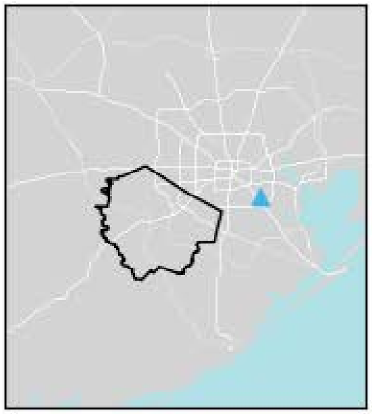
Pasadena, TX

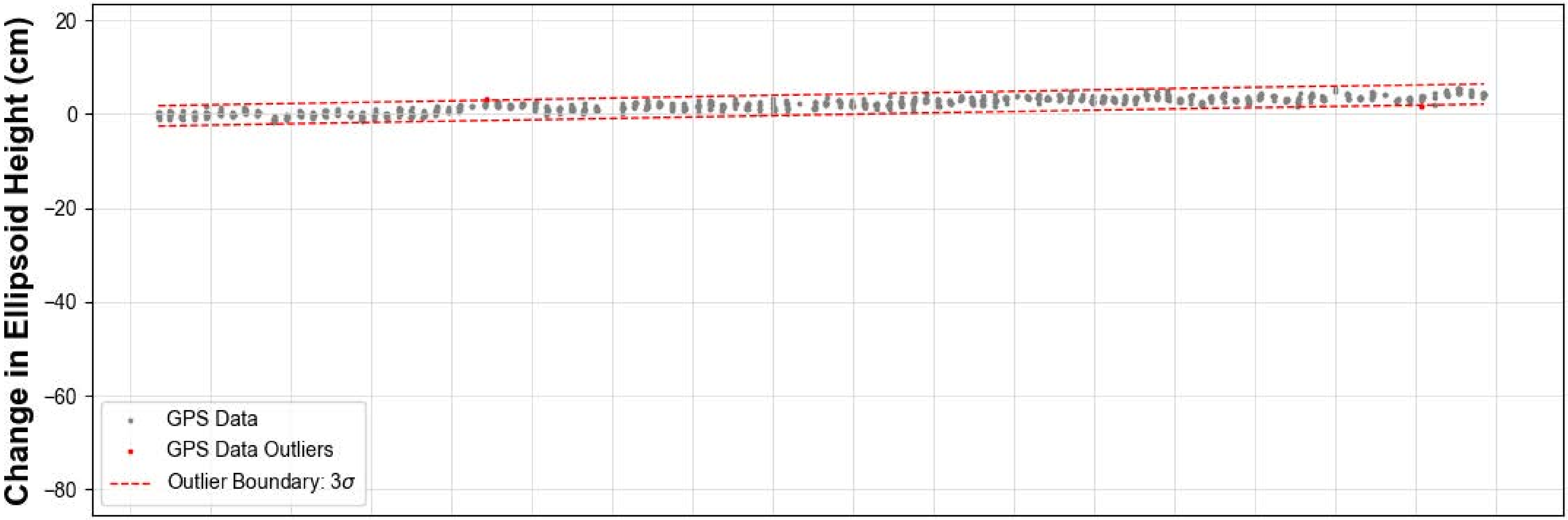


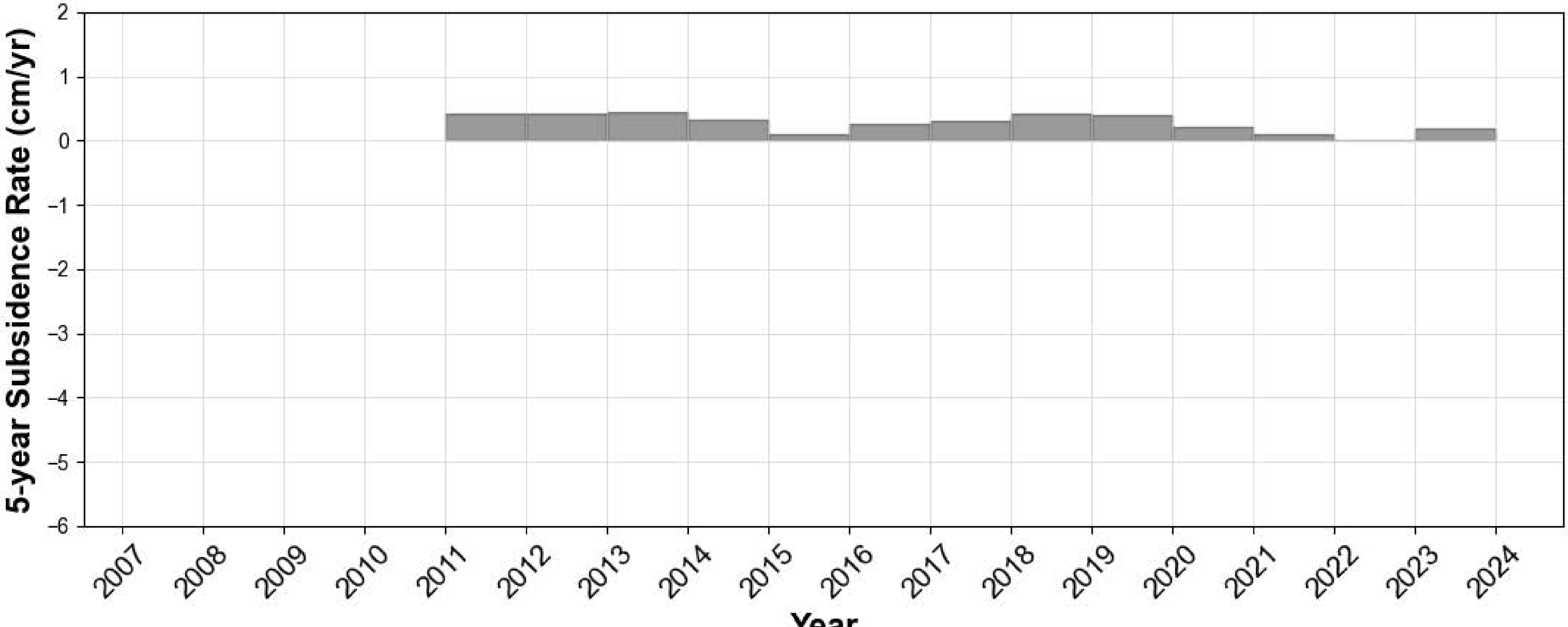
Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P038

Houston, TX



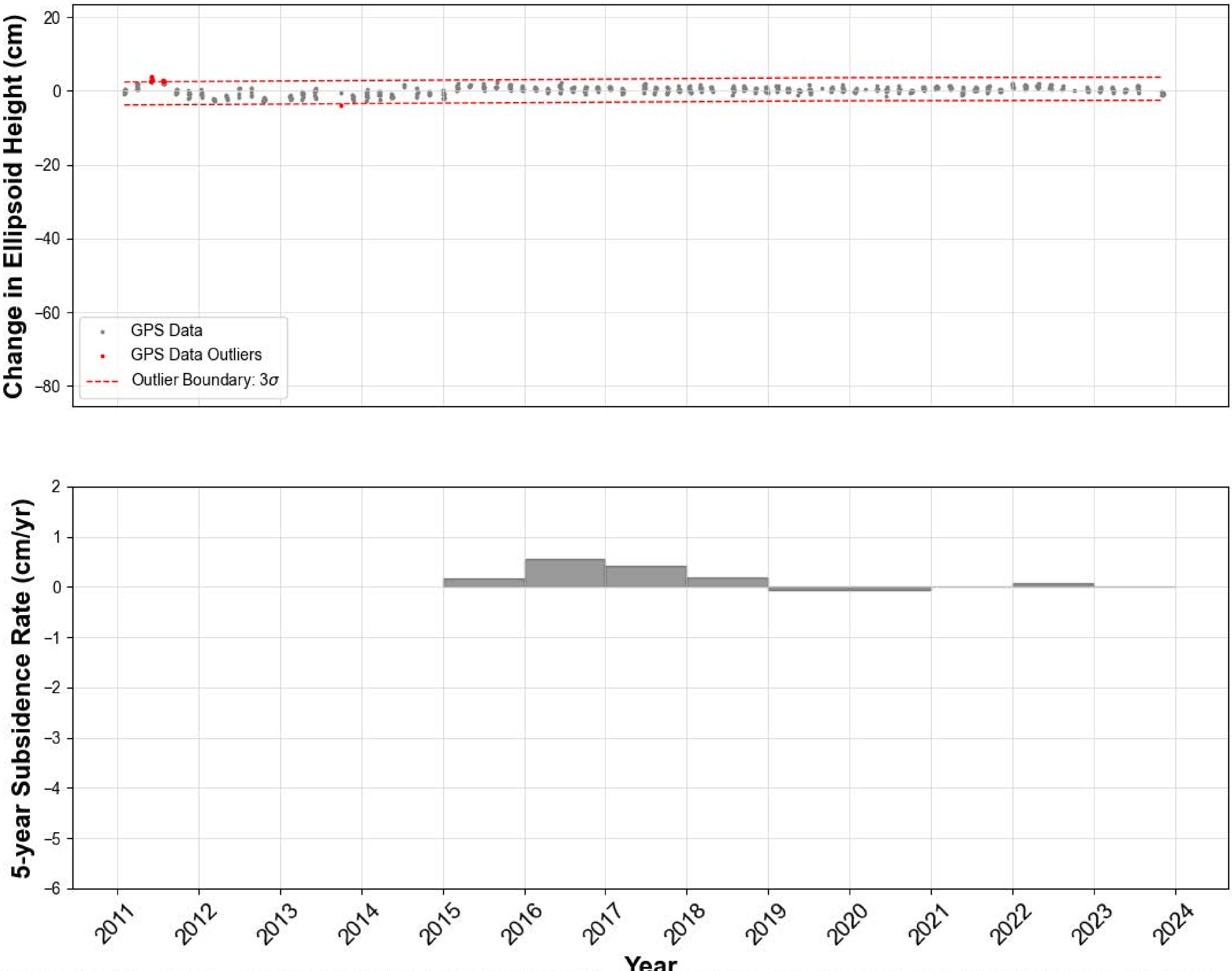




Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P039

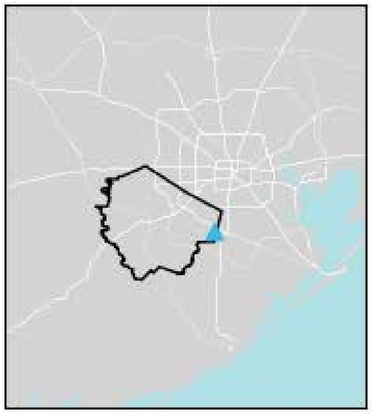
Houston, TX

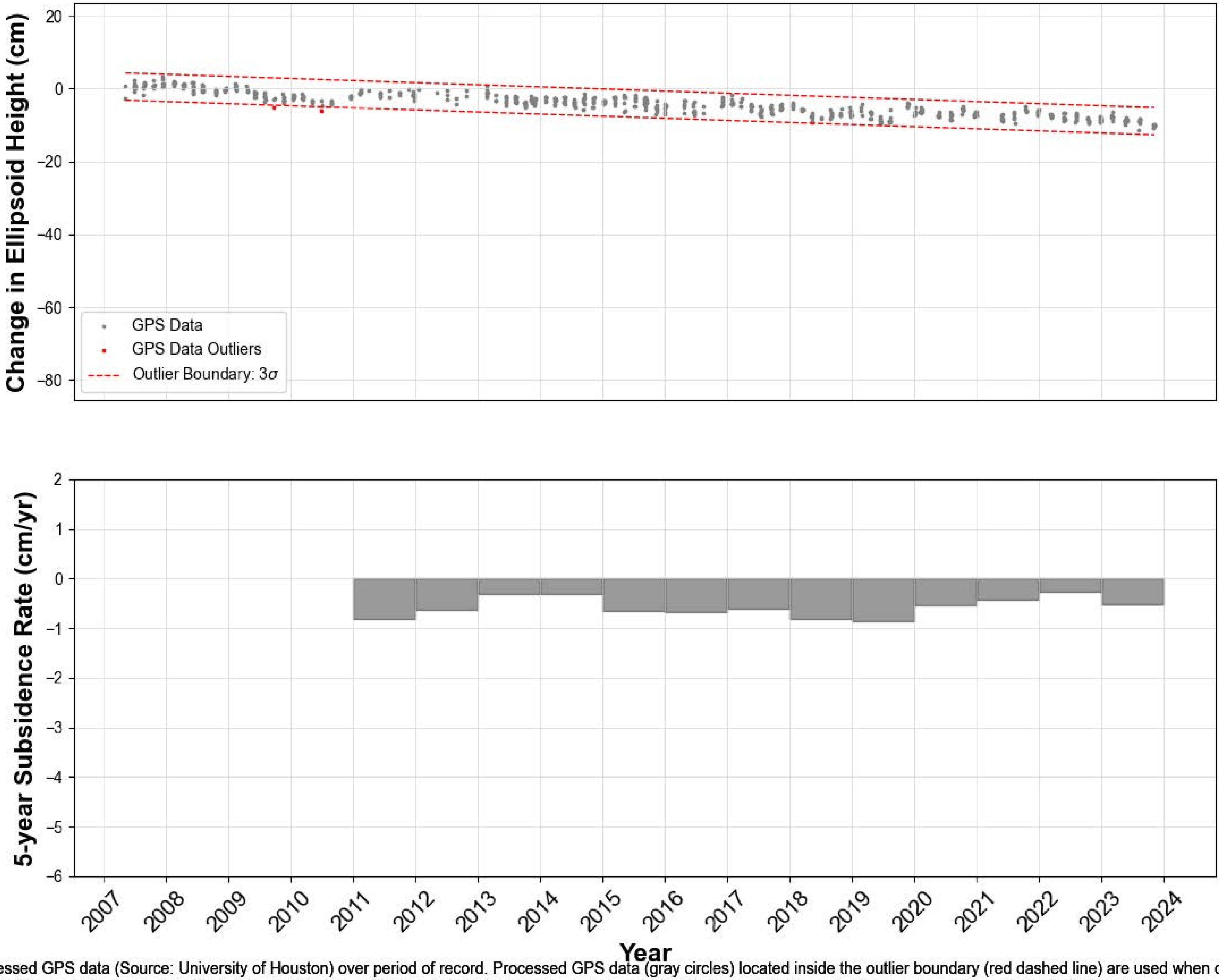


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P040

Rosharon, TX

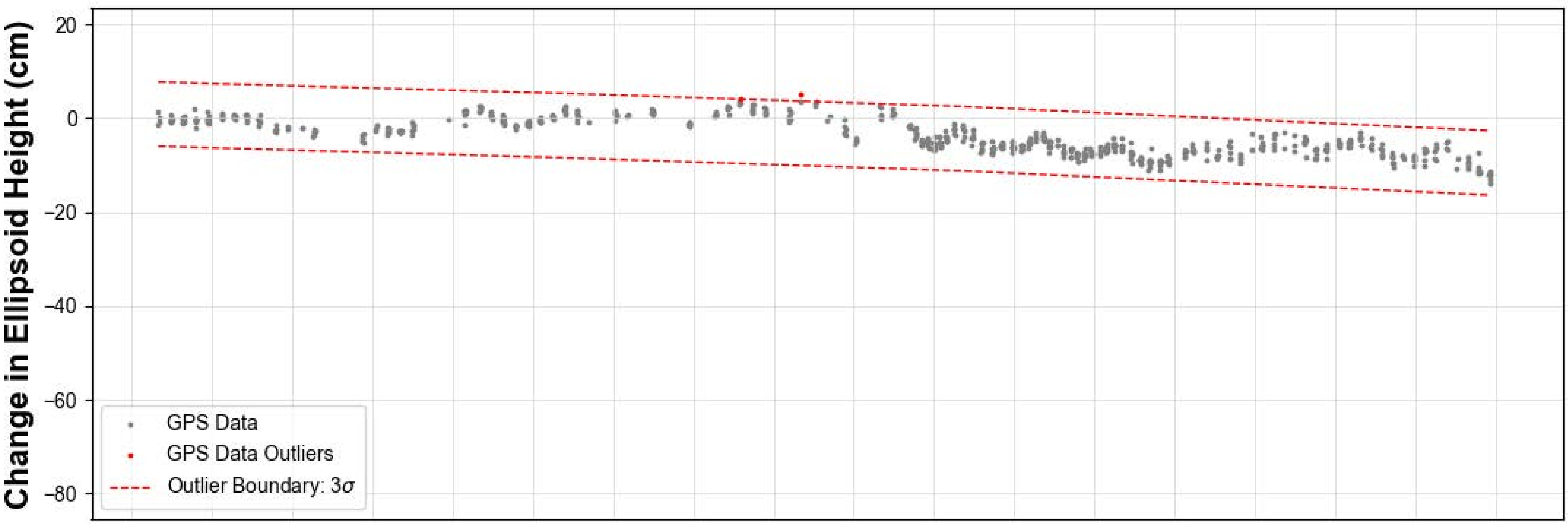


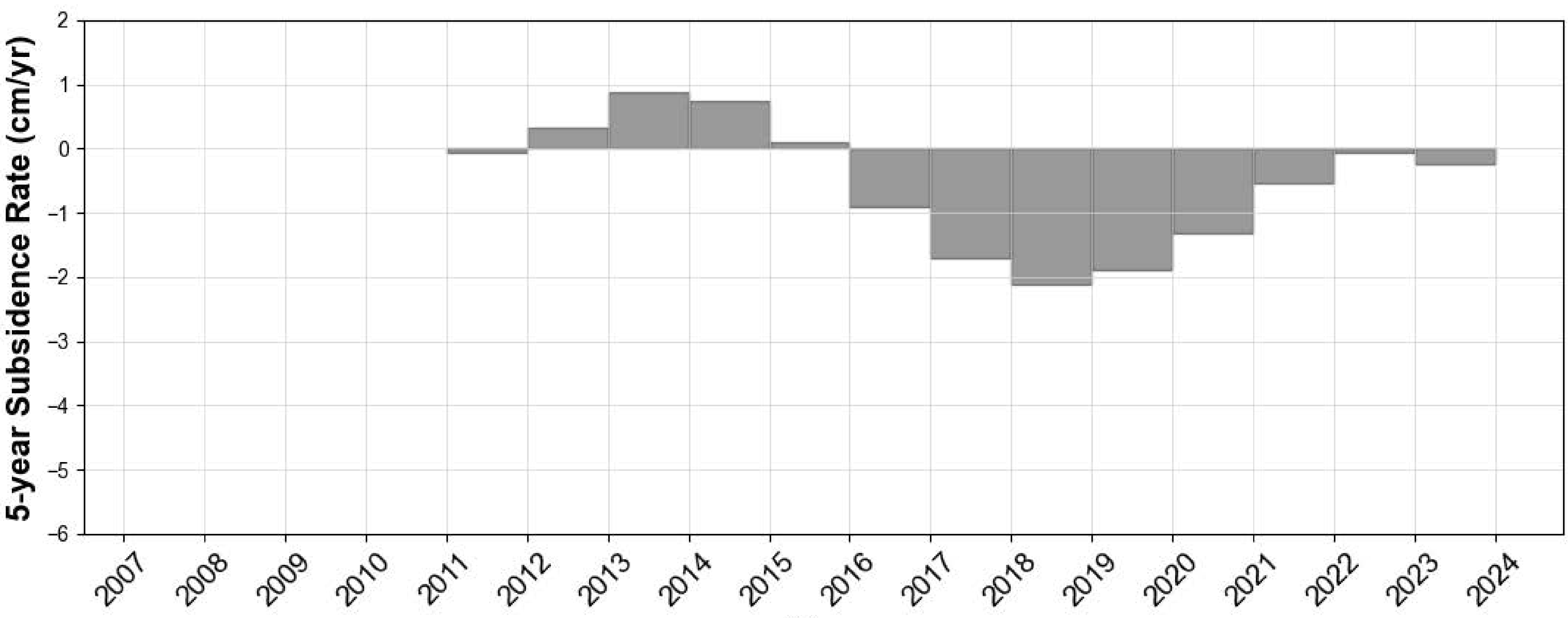


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P041

Houston, TX

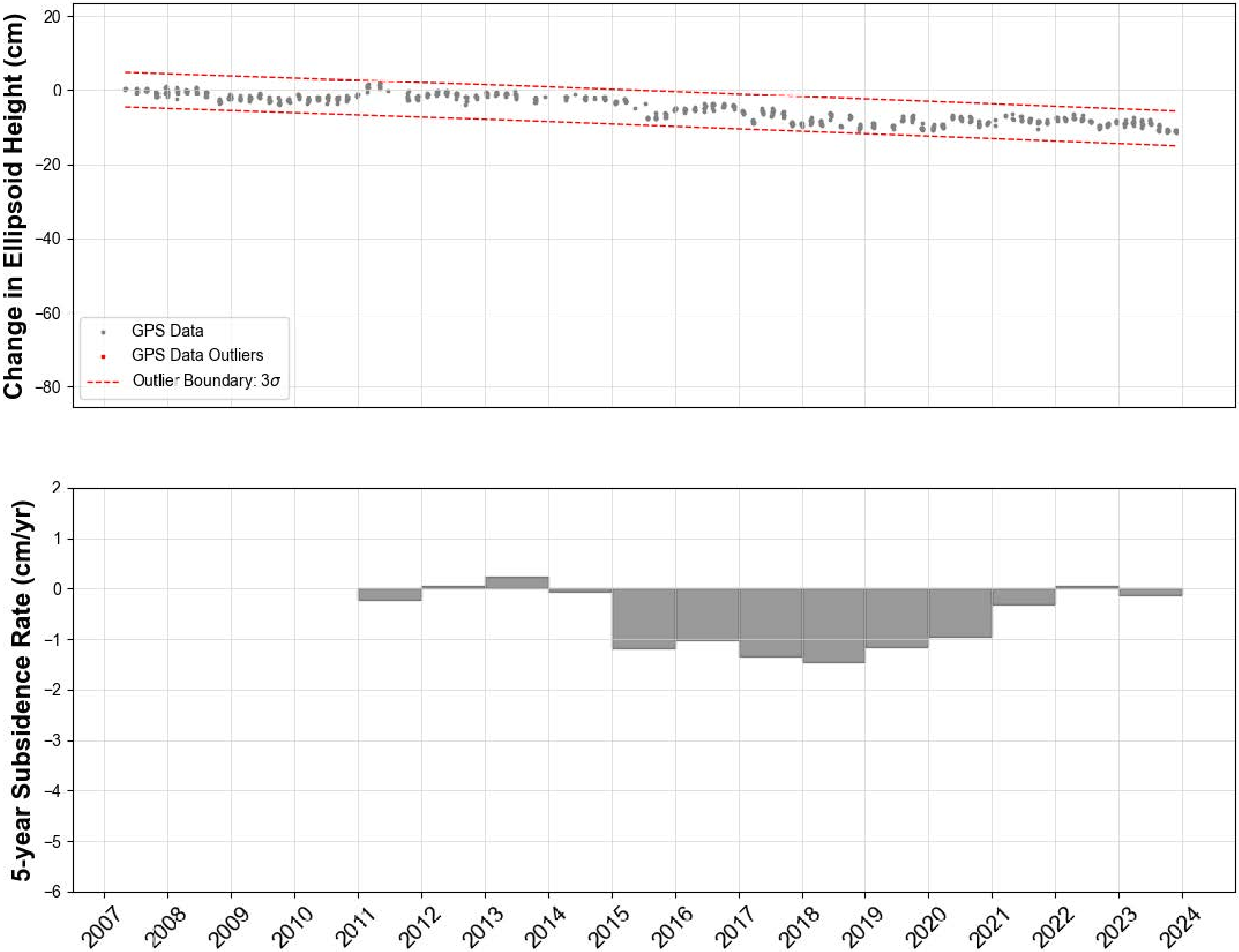




Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P042

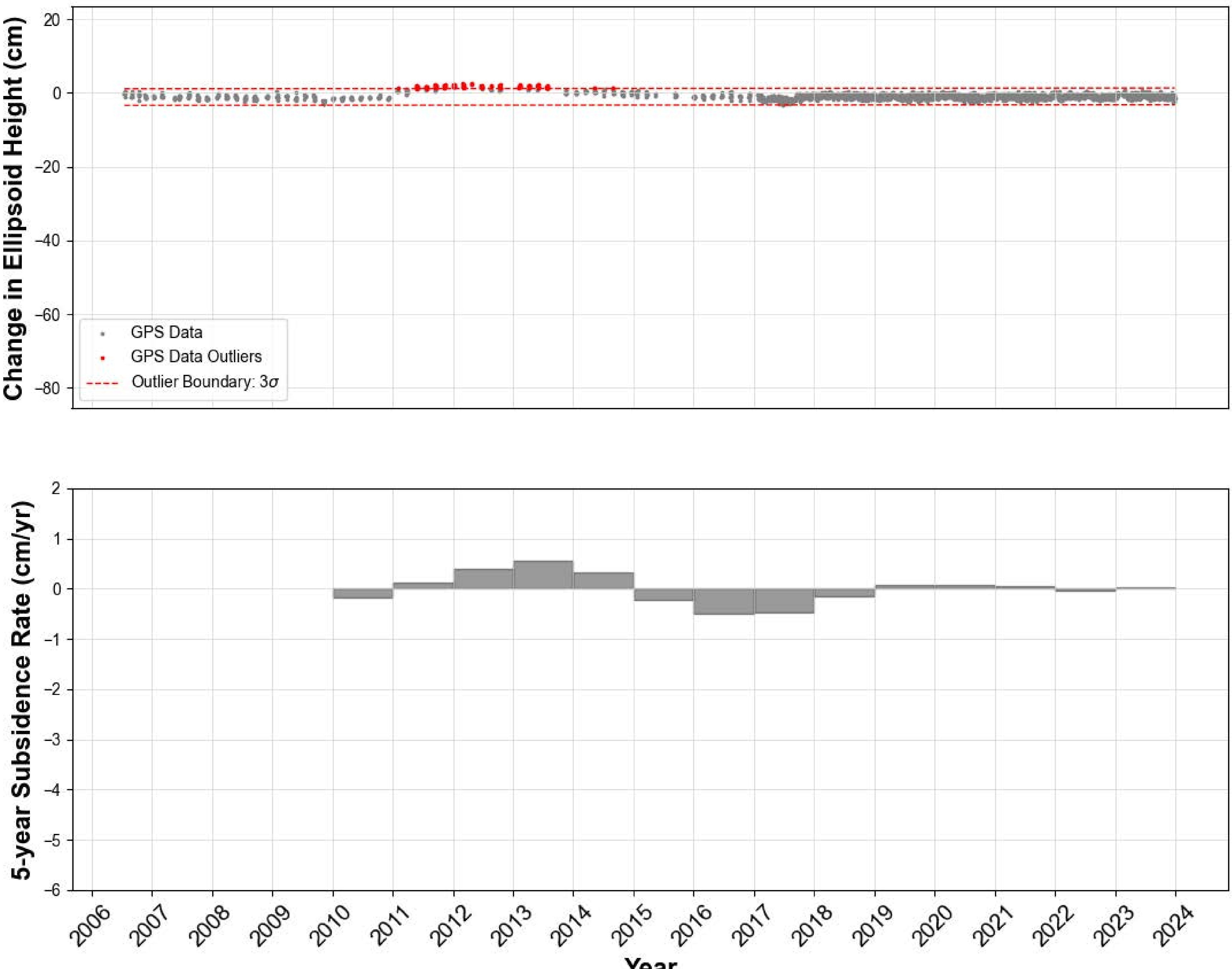
Houston, TX



Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P043

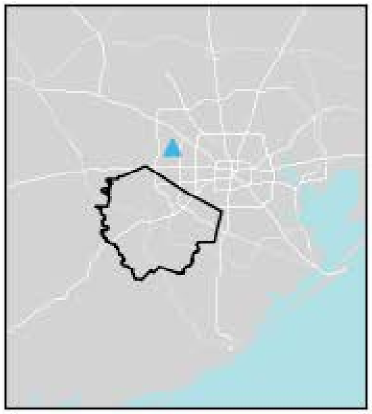
Galveston, TX

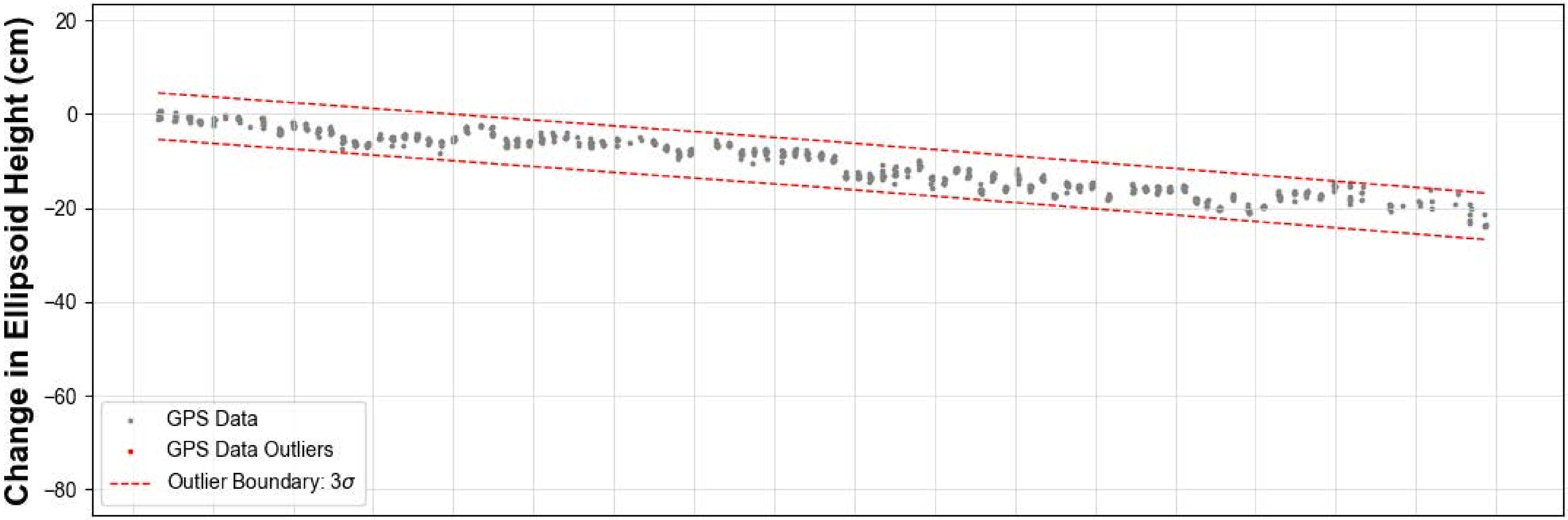


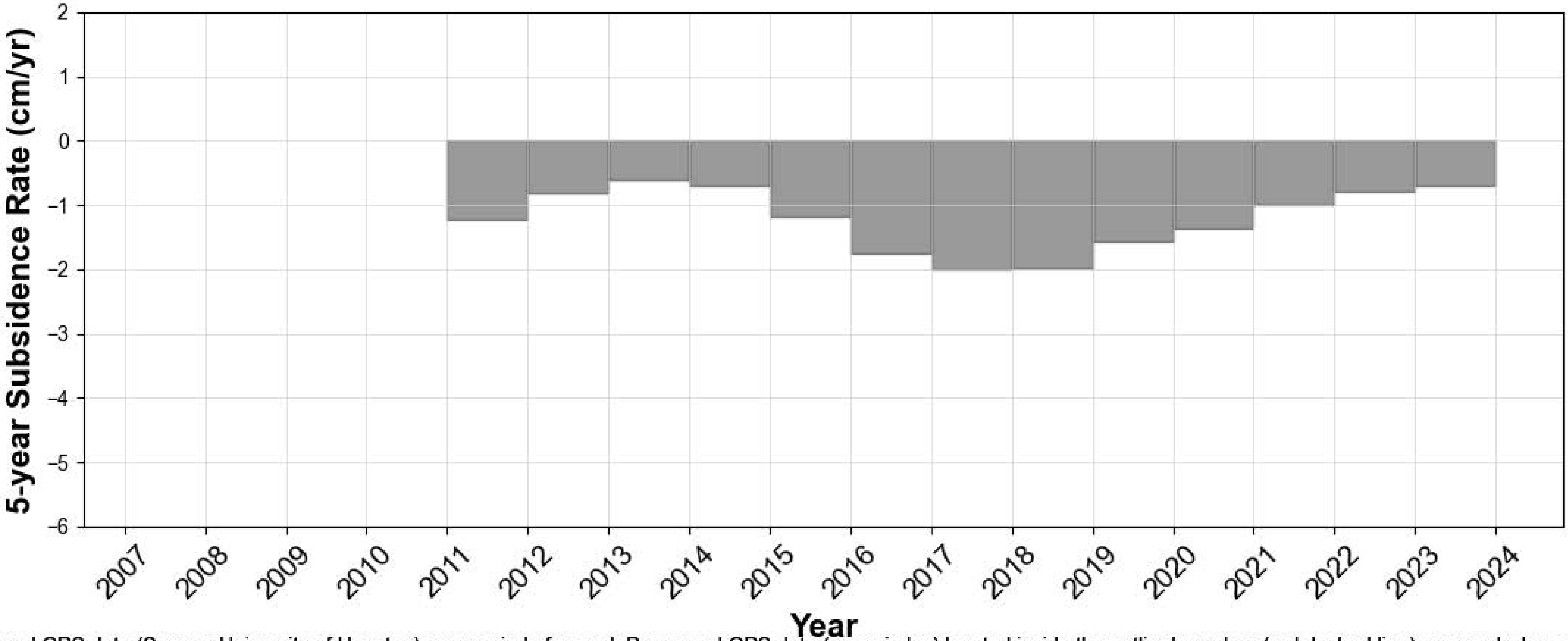
Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P044

Cypress, TX



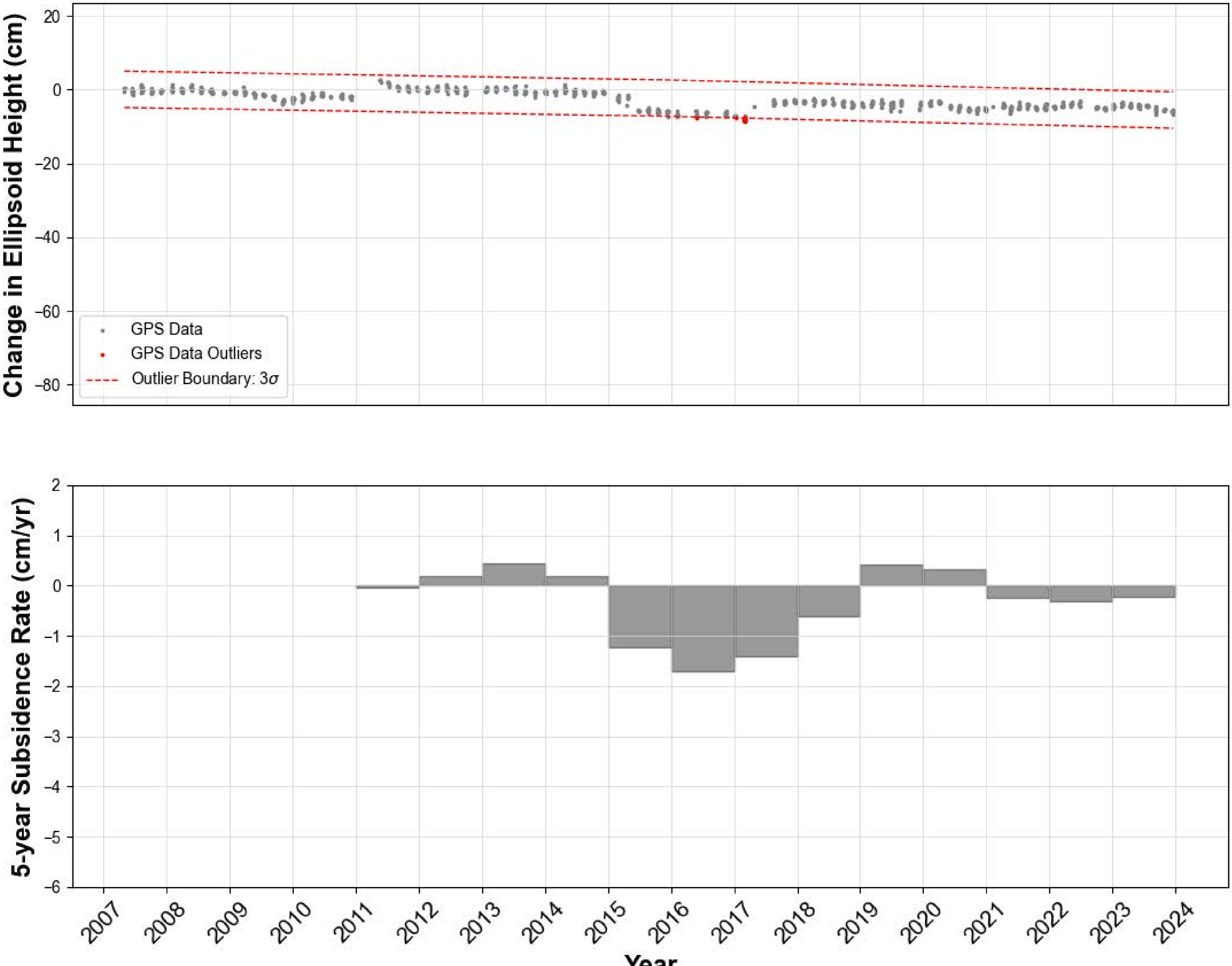




Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P045

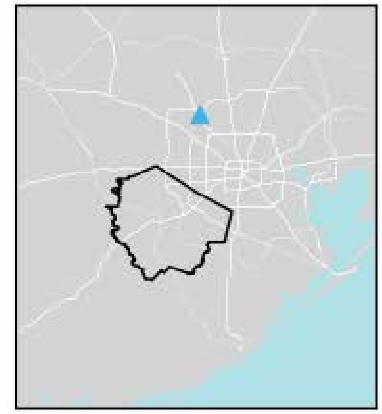
Houston, TX

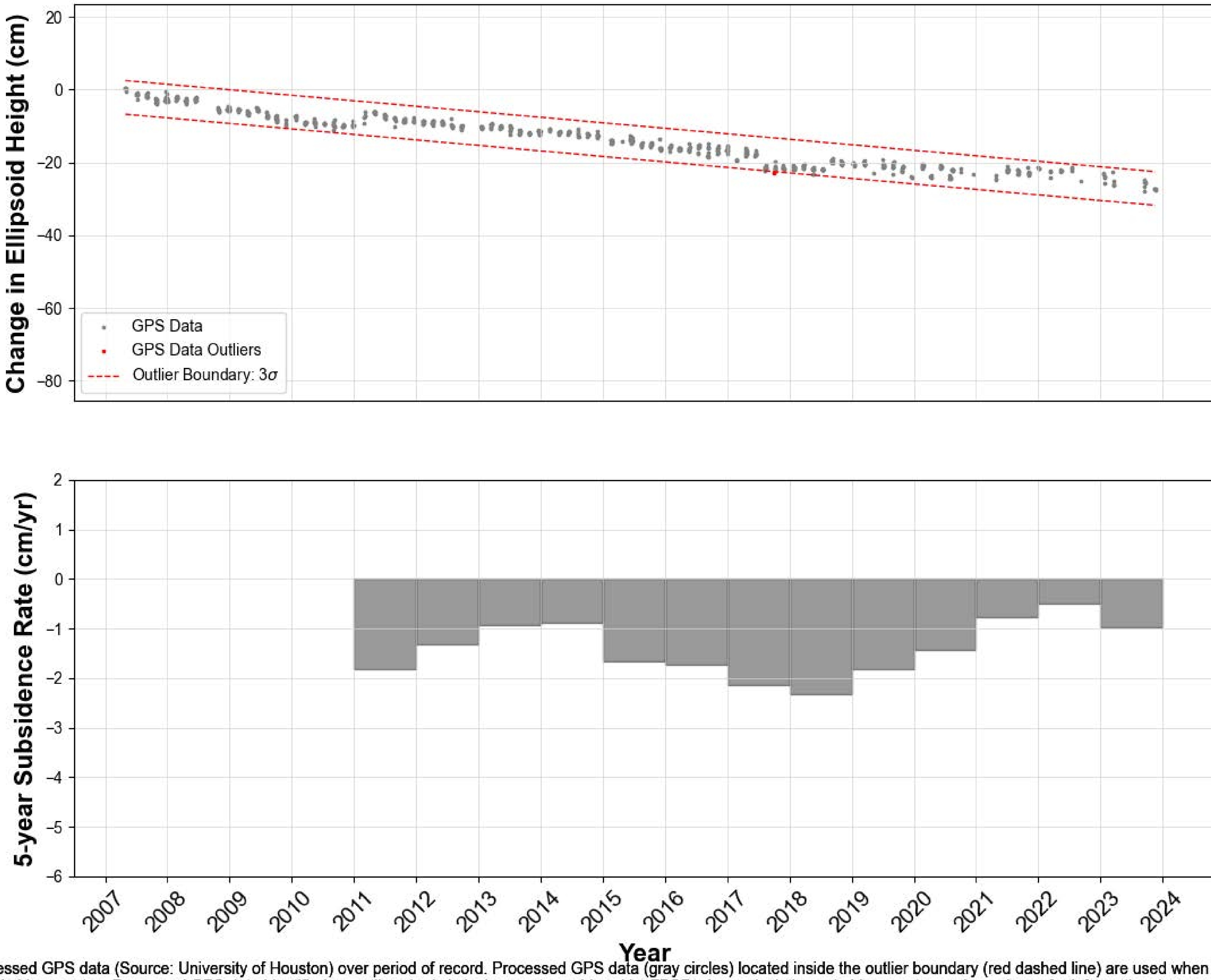


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P046

Tomball, TX

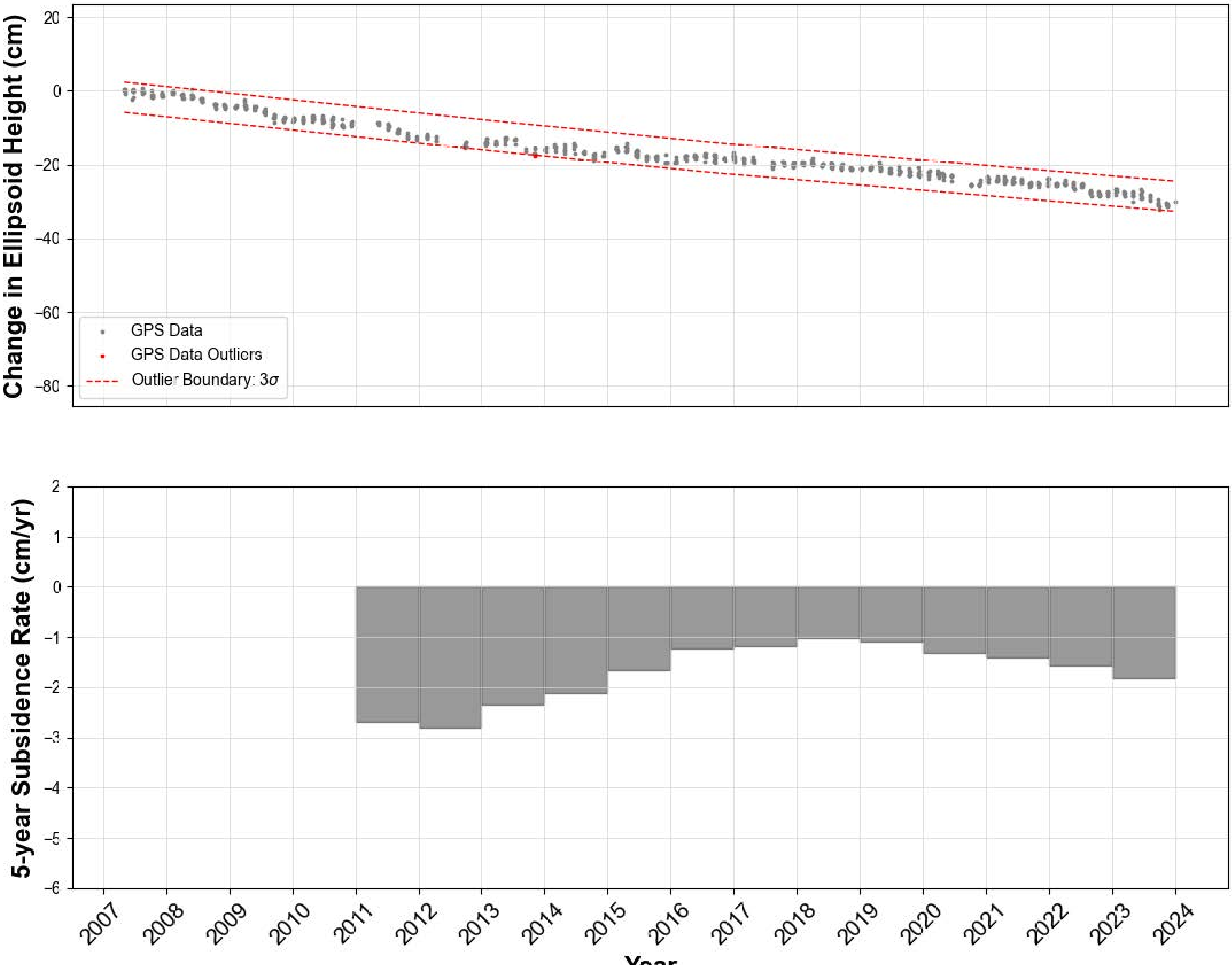




Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P047

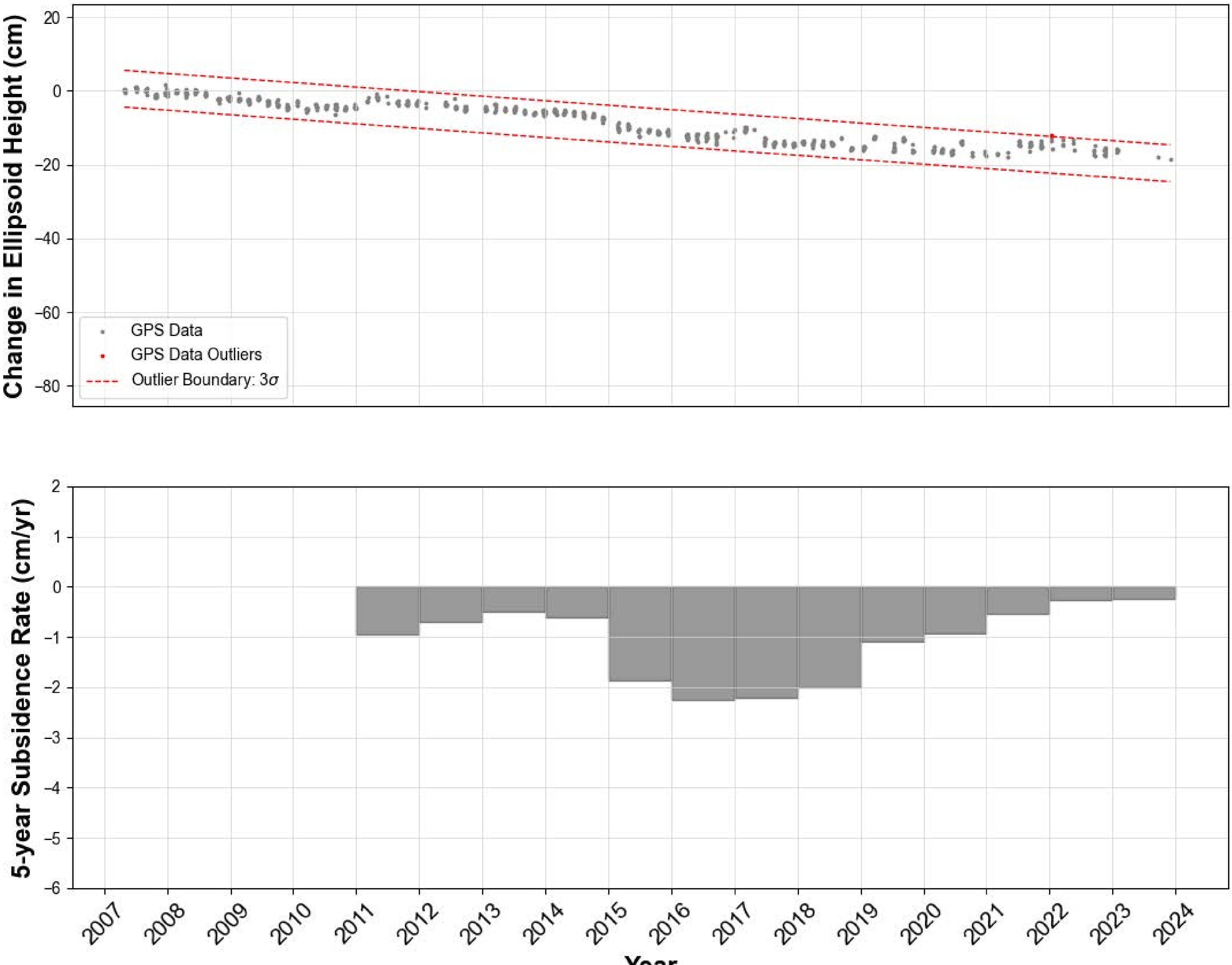
Spring, TX



Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P048

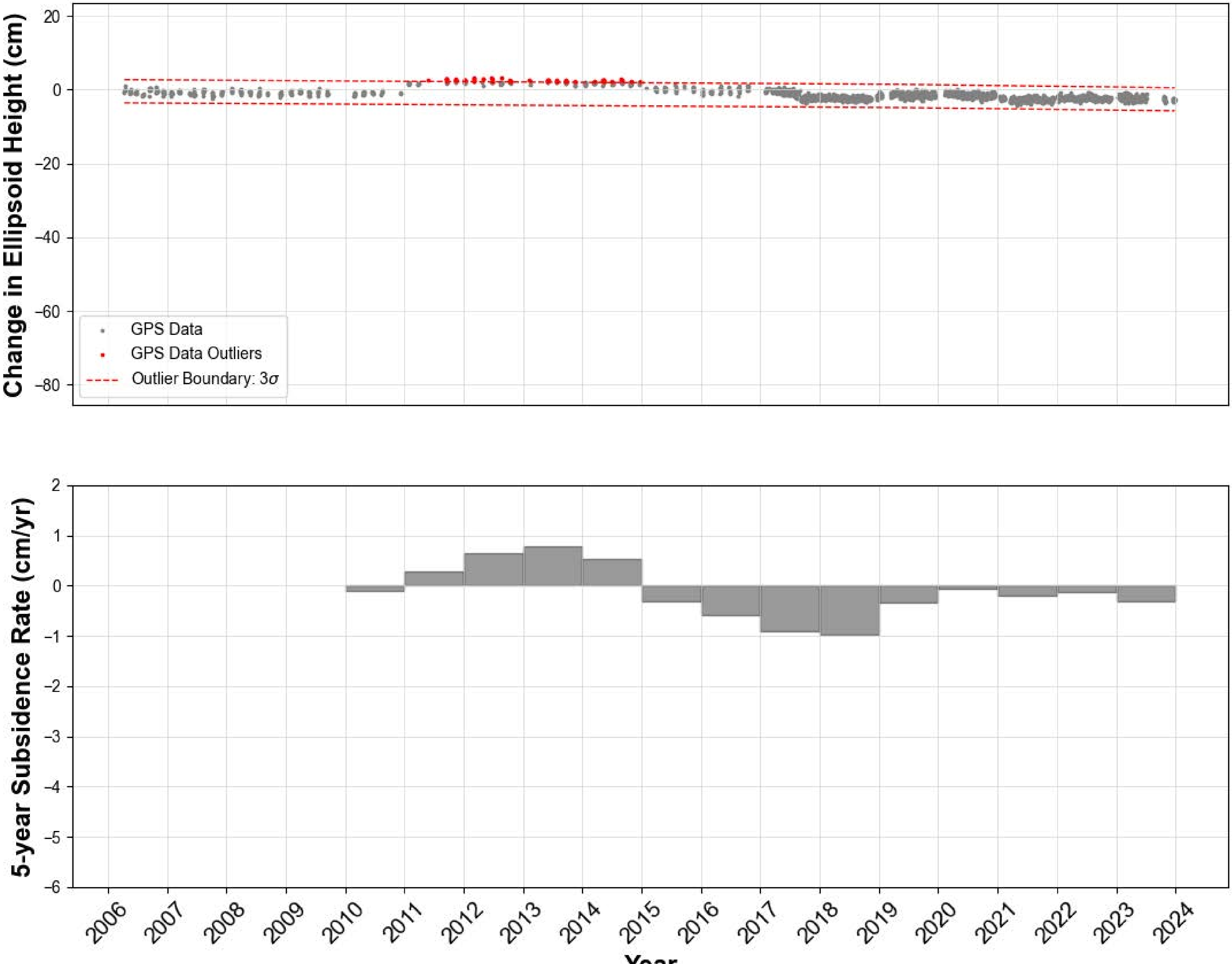
Cypress, TX



Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P049

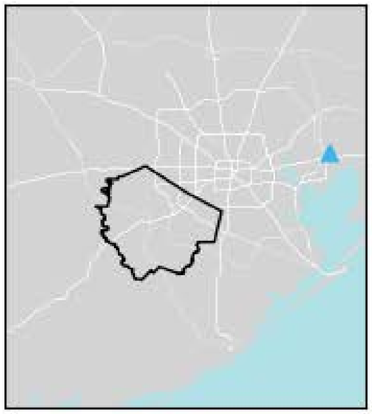
Bolivar Peninsula, TX

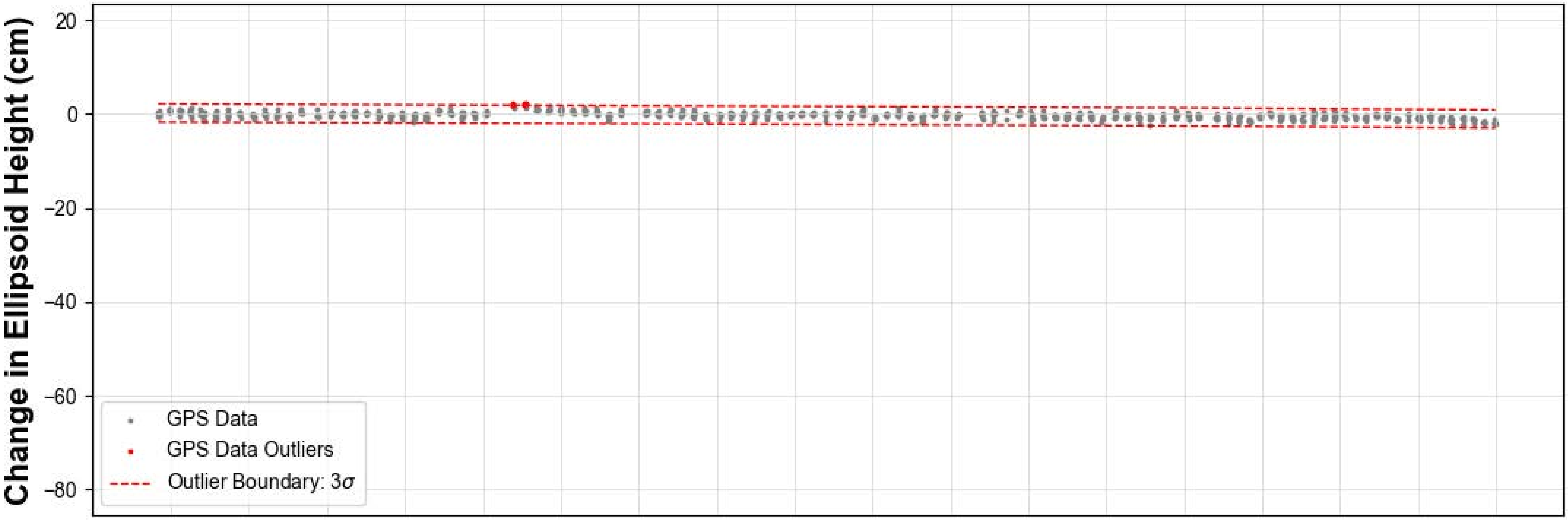


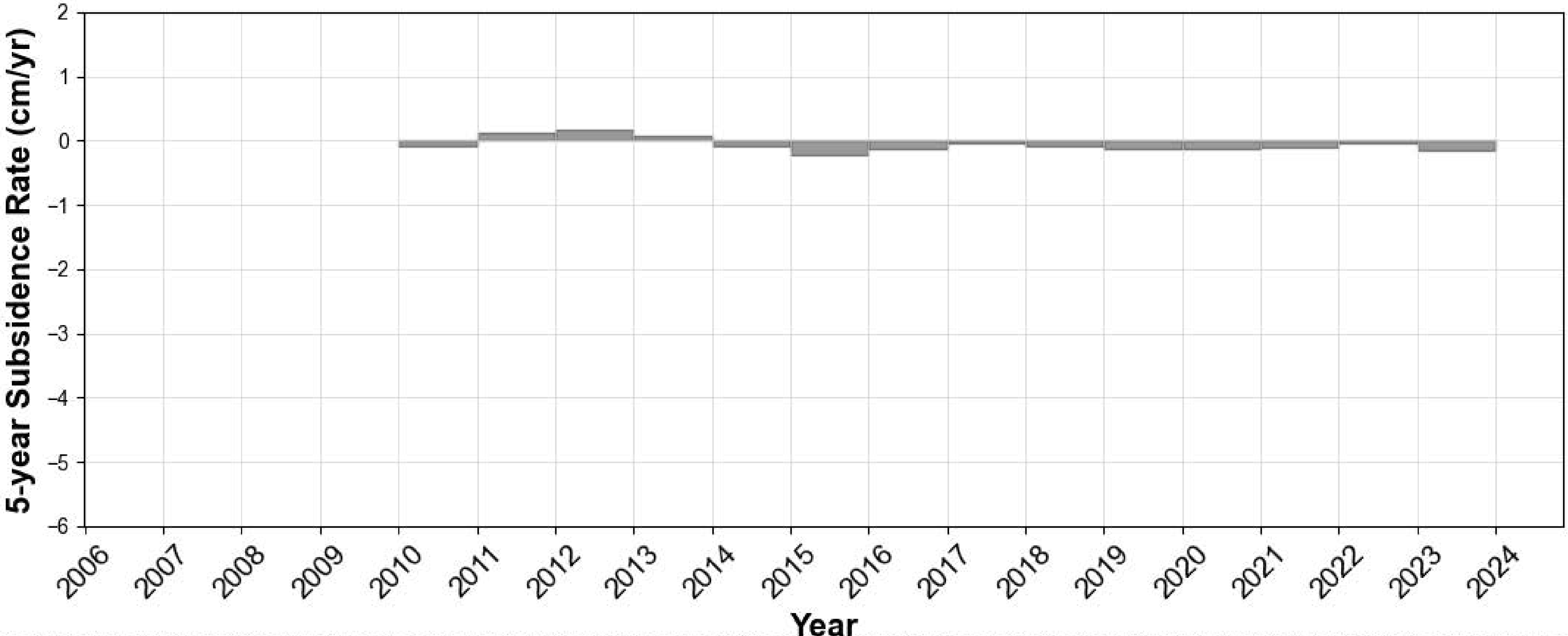
Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P050

Mont Belvieu, TX



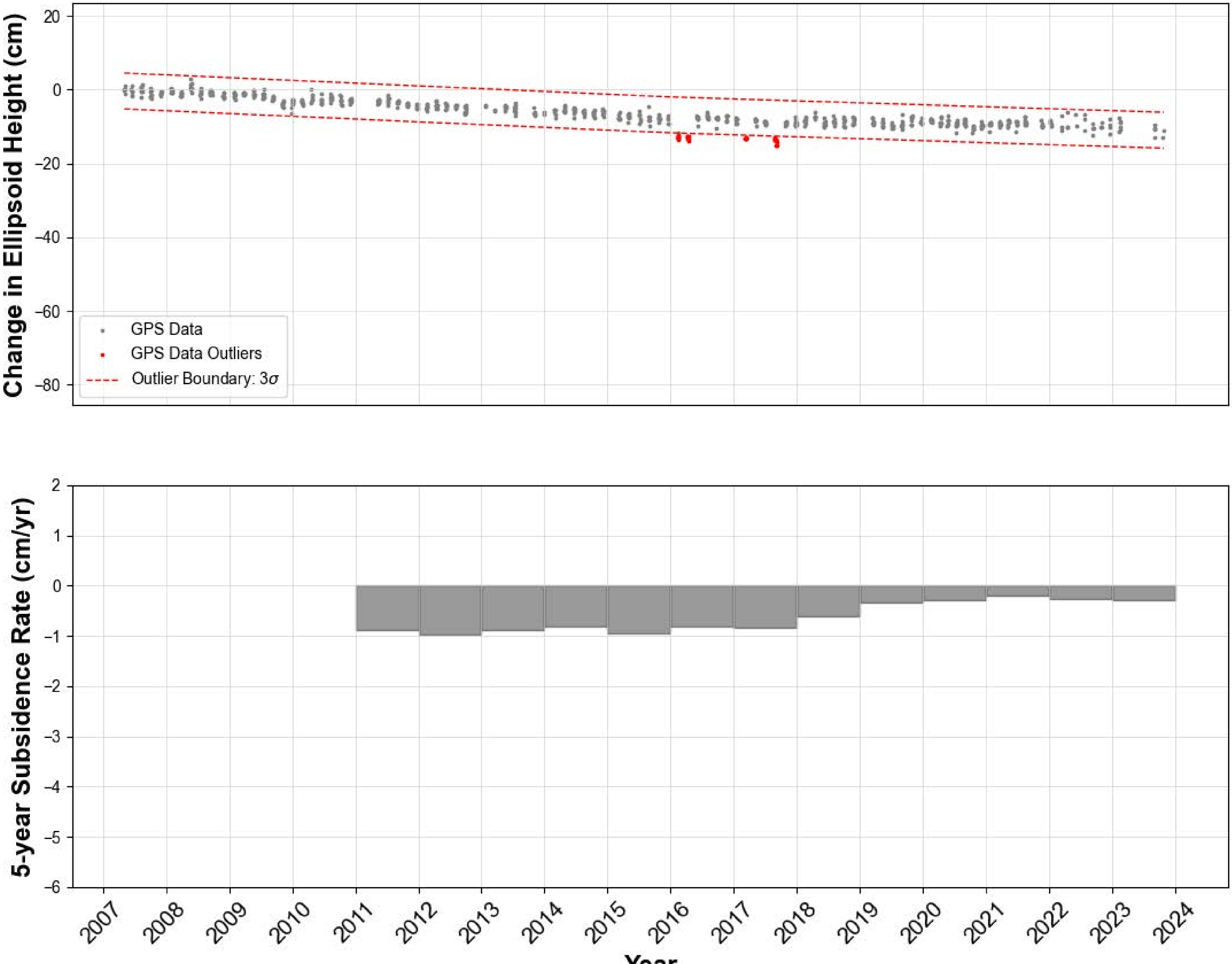




Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P051

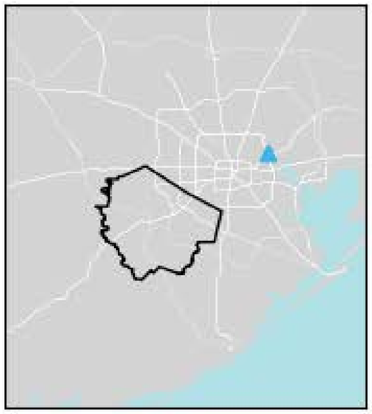
Humble, TX

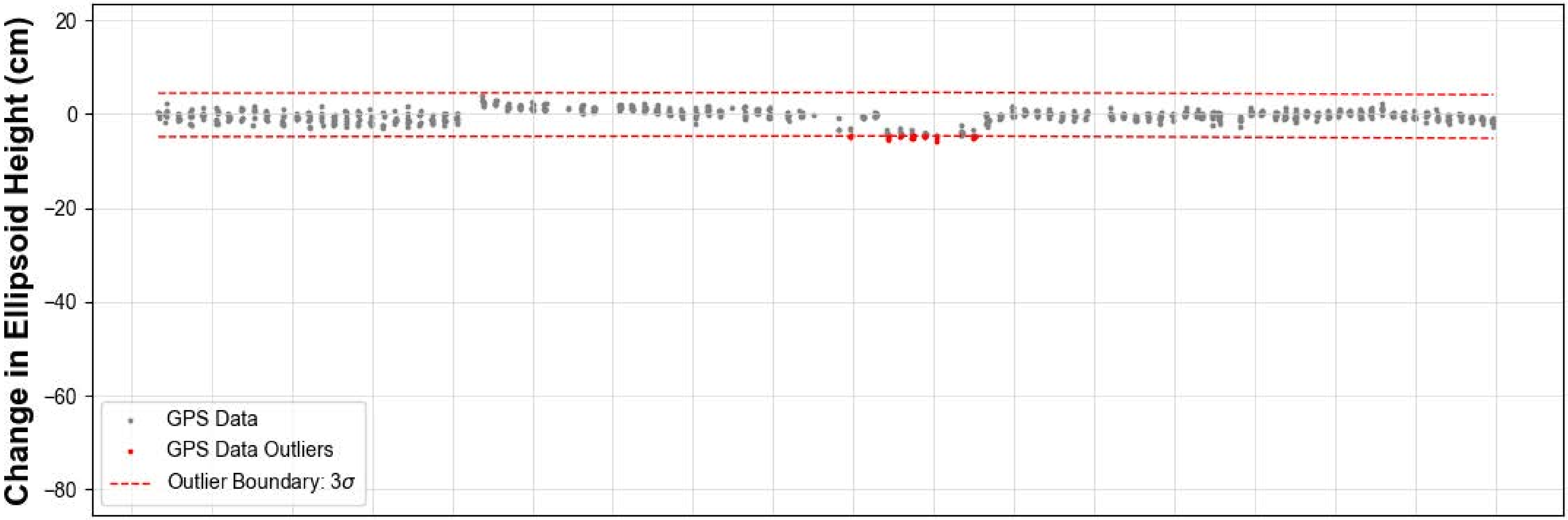


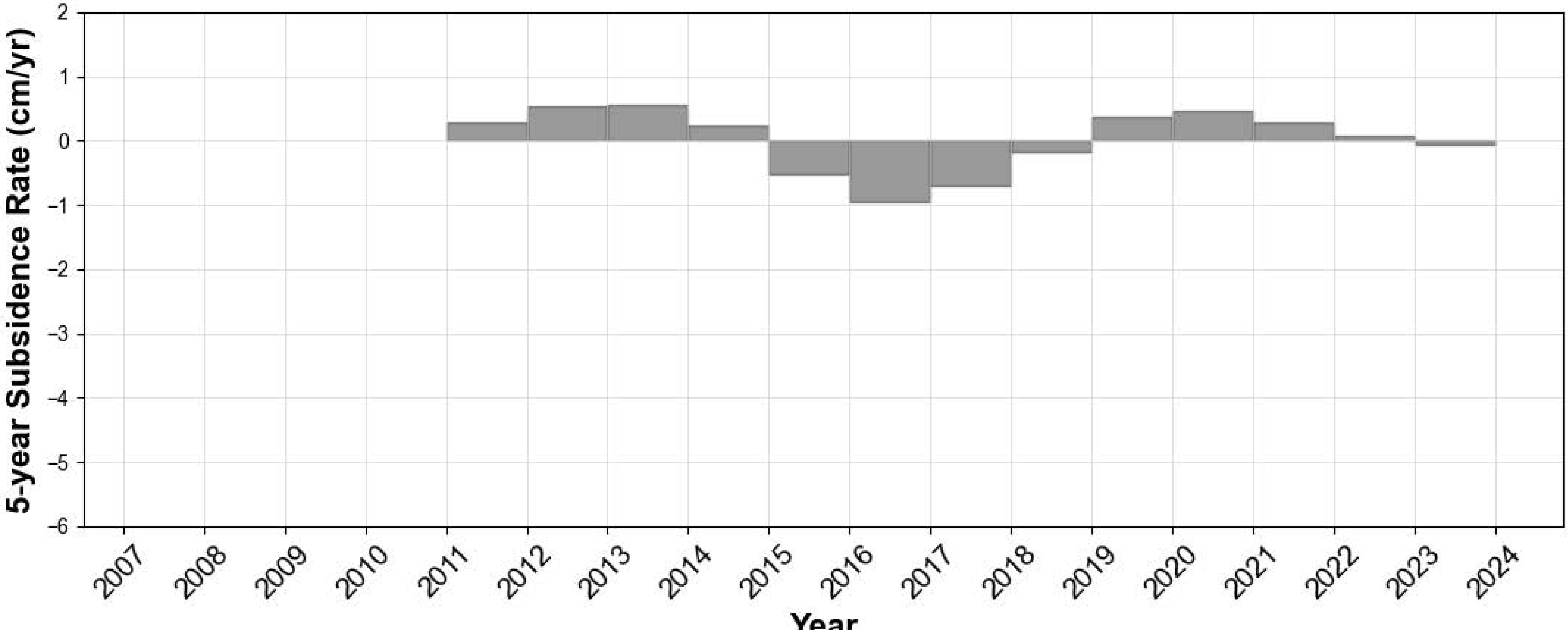
Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P052

Houston, TX



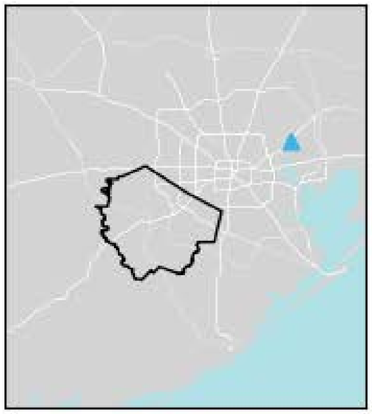


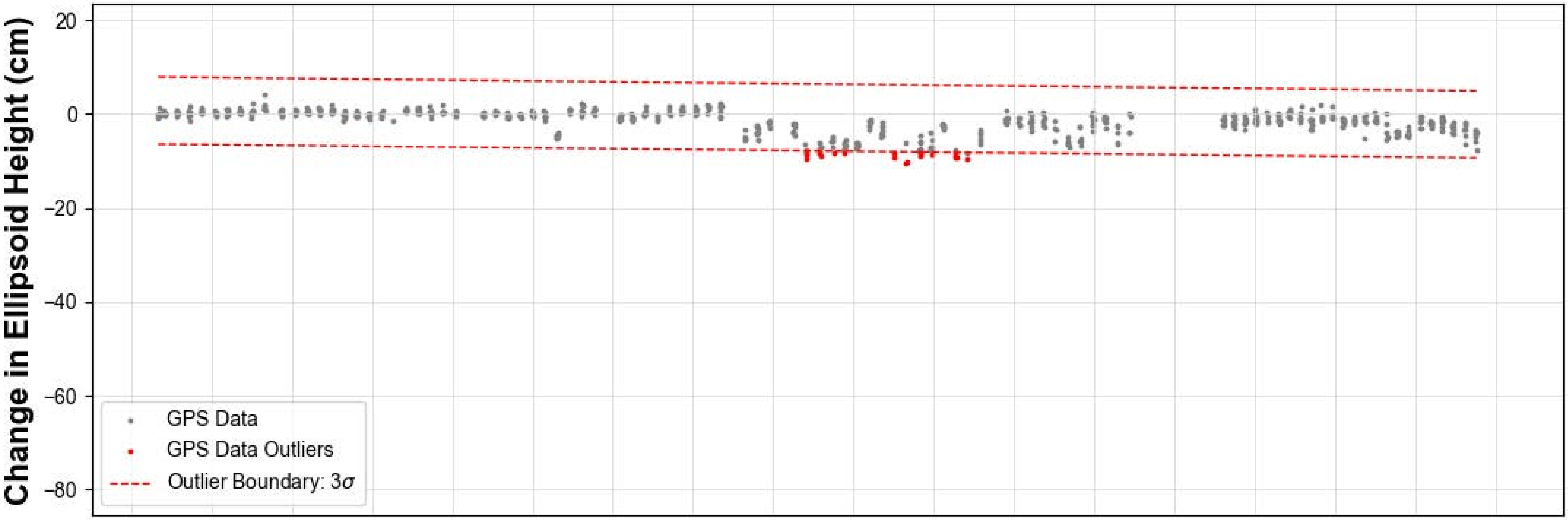


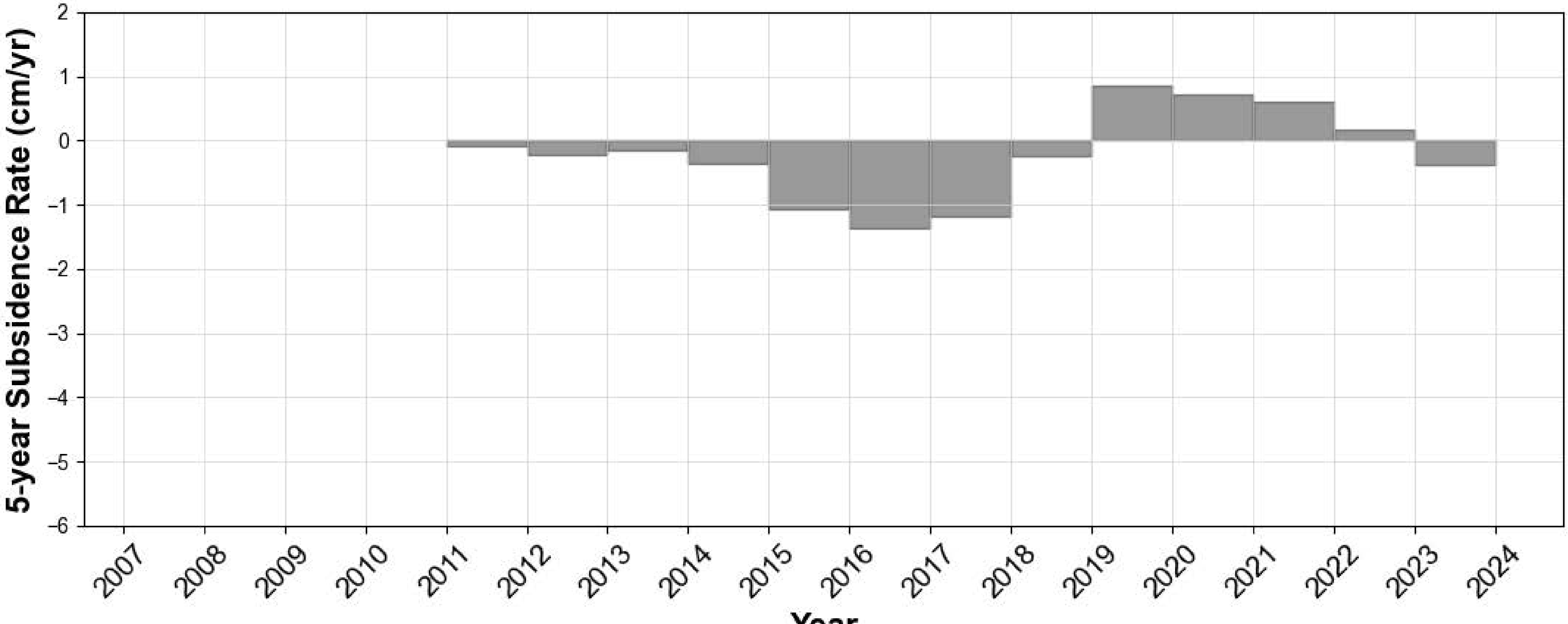
Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P053

Crosby, TX



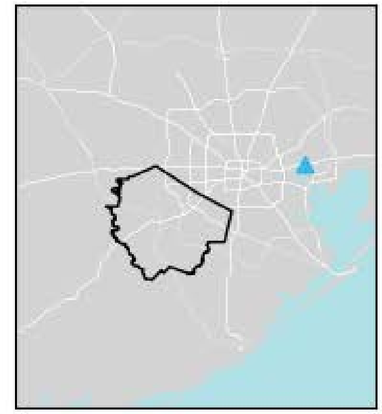


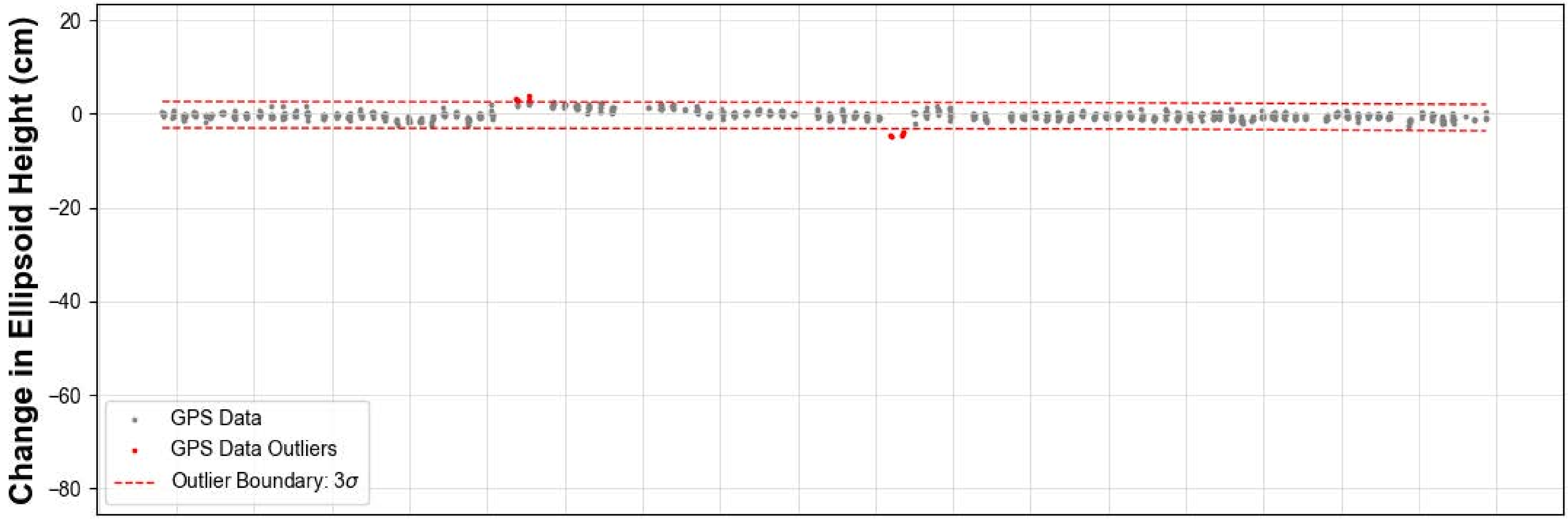


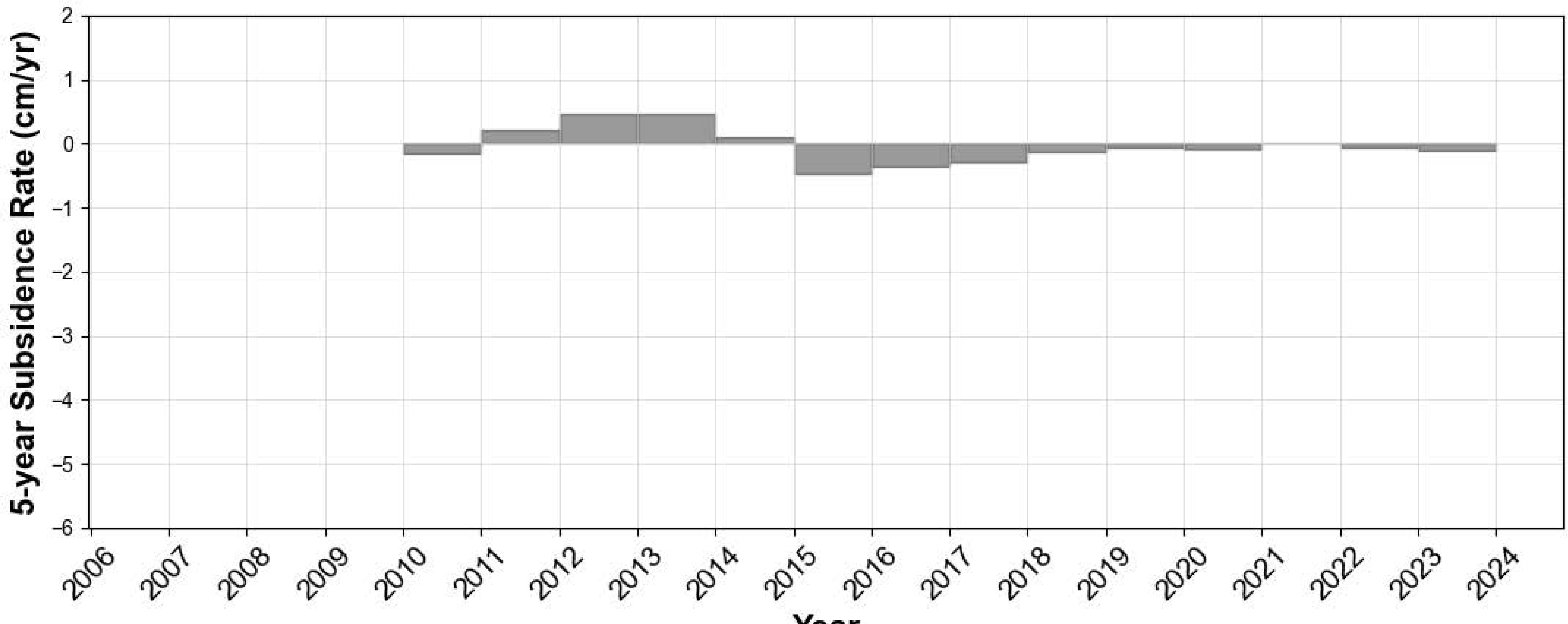
Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P054

Baytown, TX



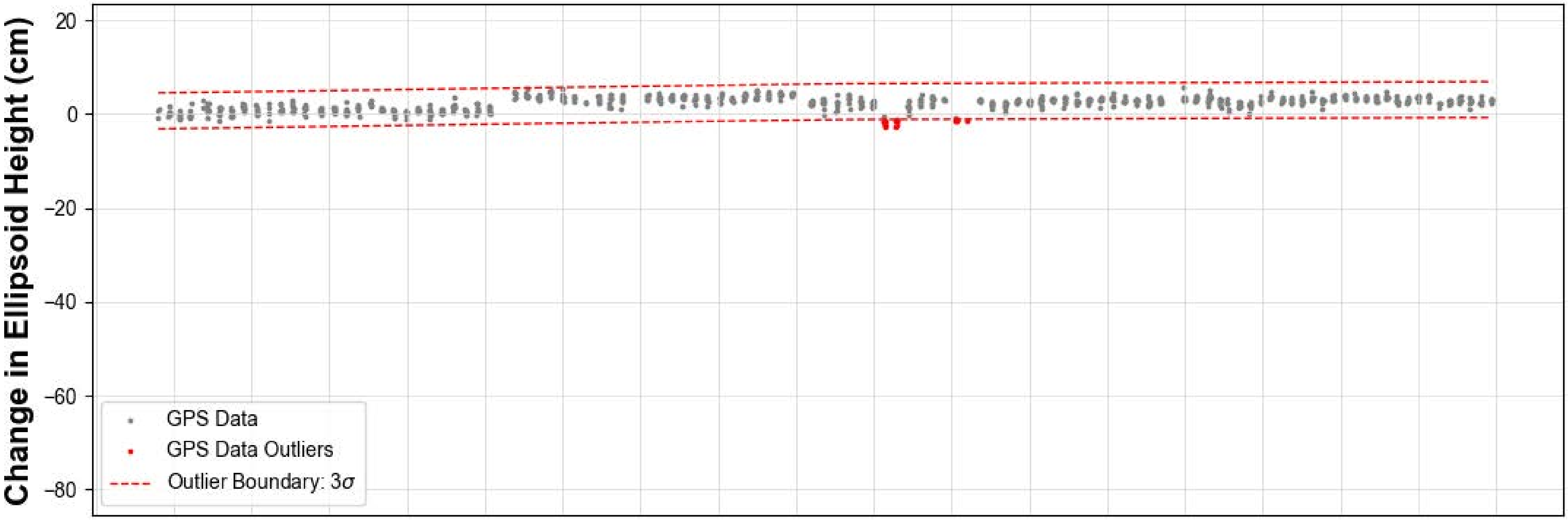


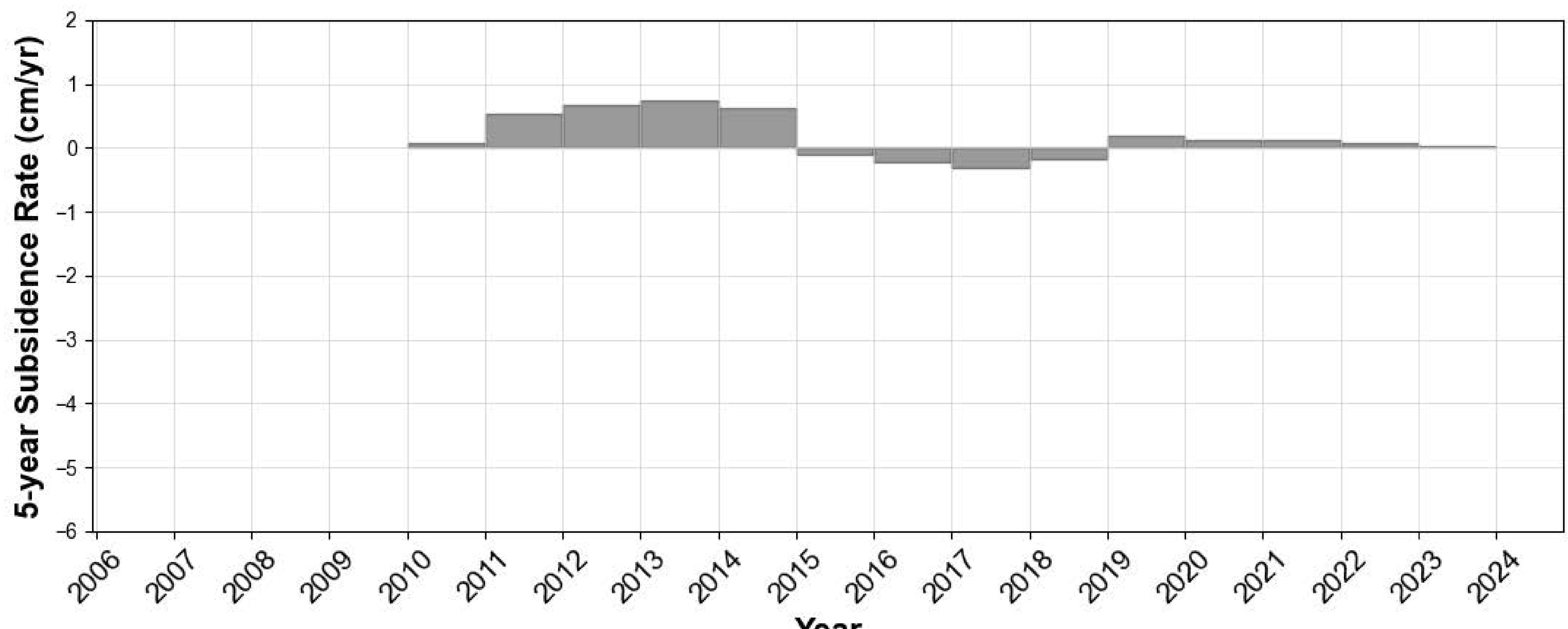


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

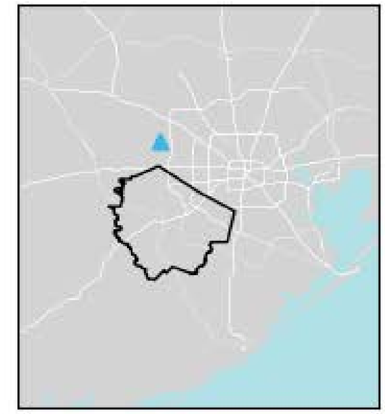
P055

Houston, TX



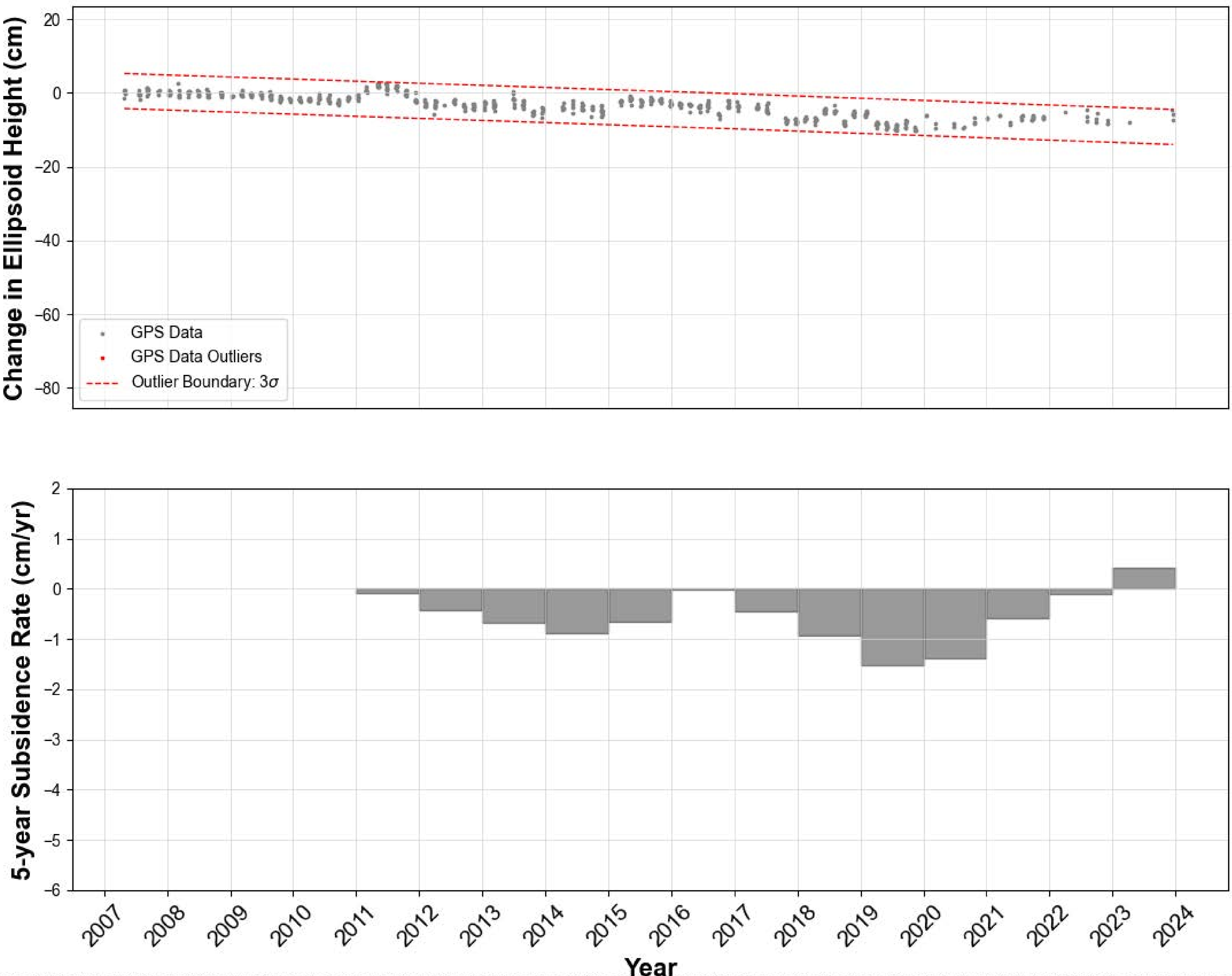


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.



P056

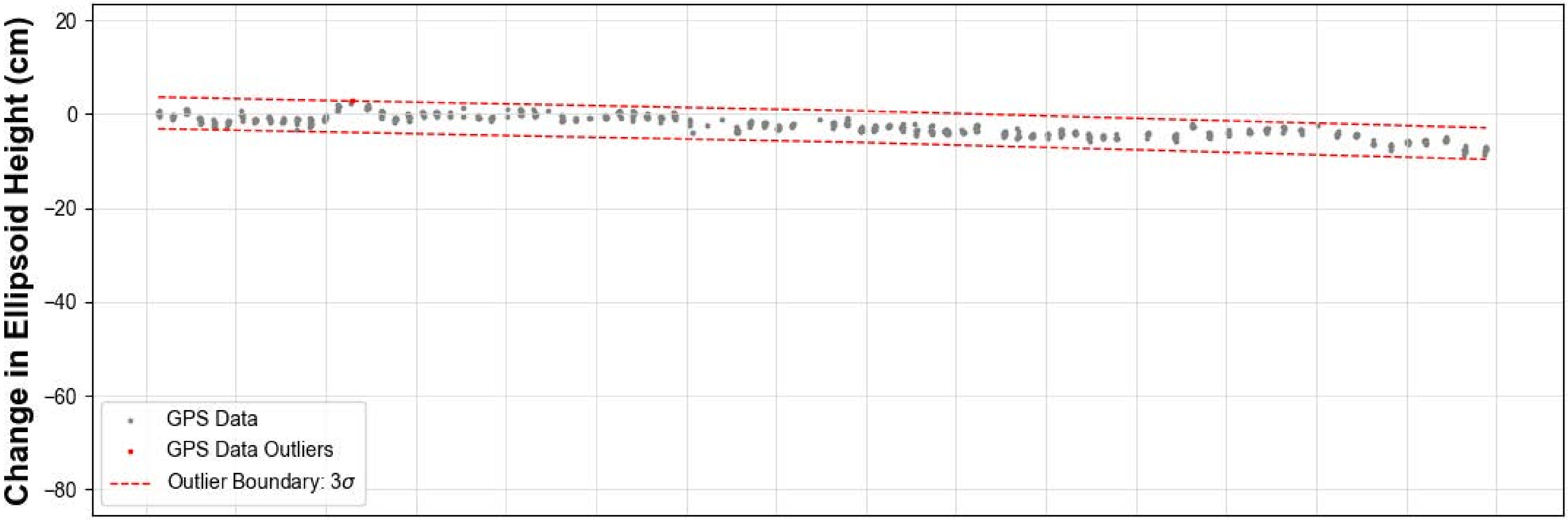
Katy, TX

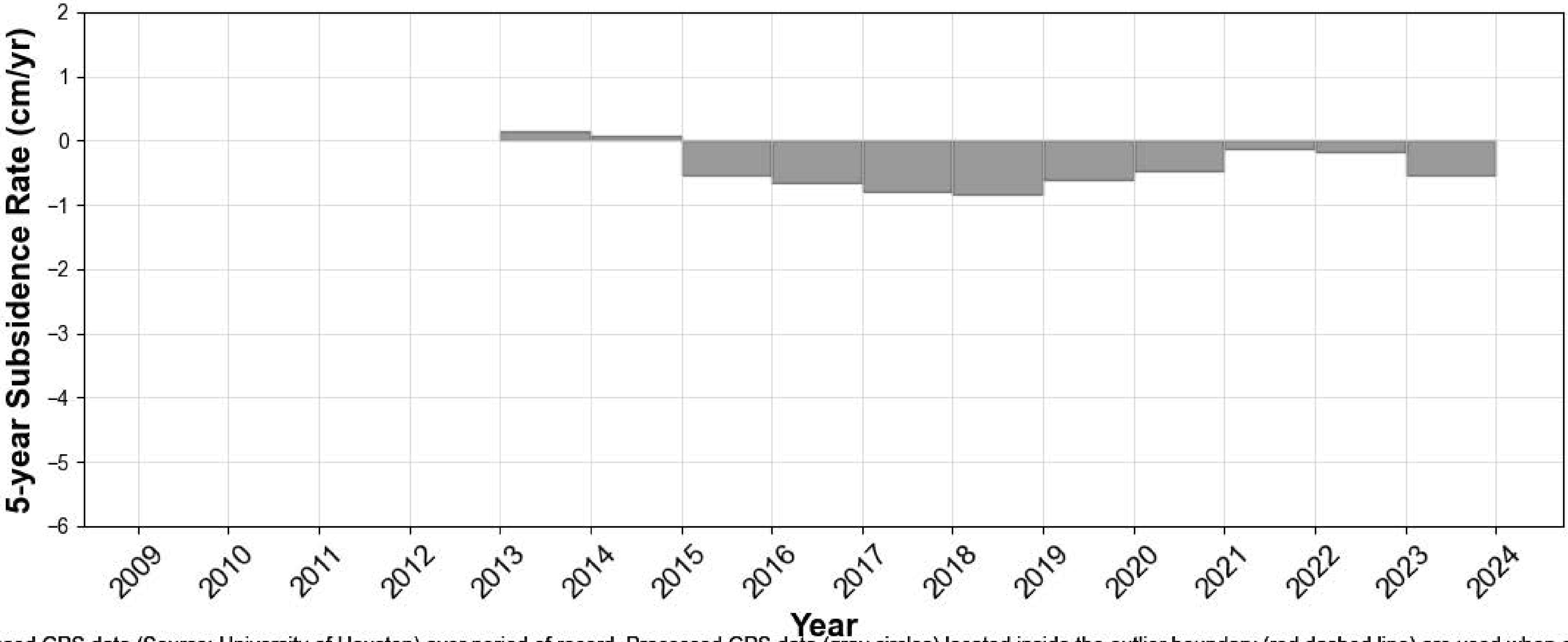


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P057

Richmond, TX

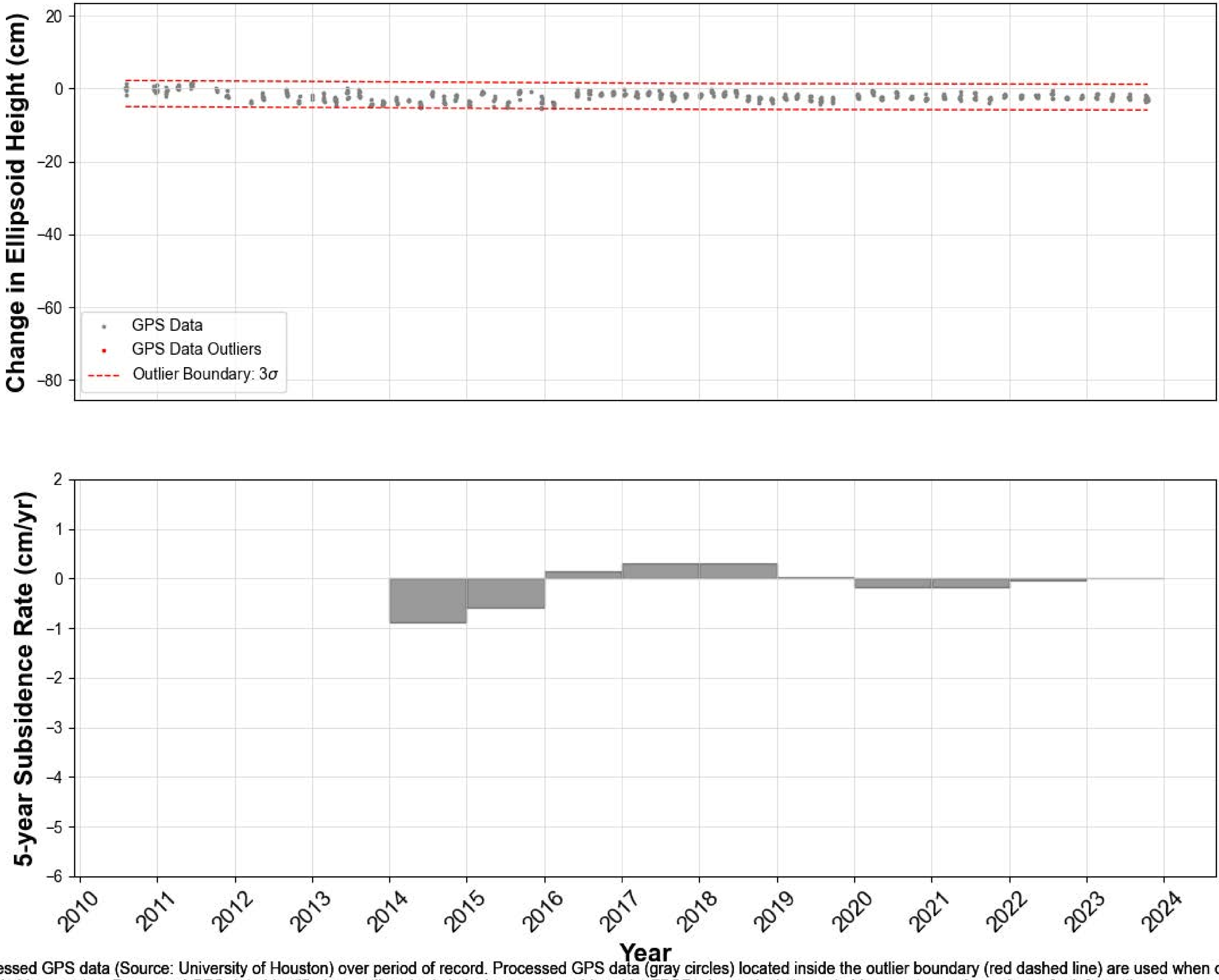




Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P058

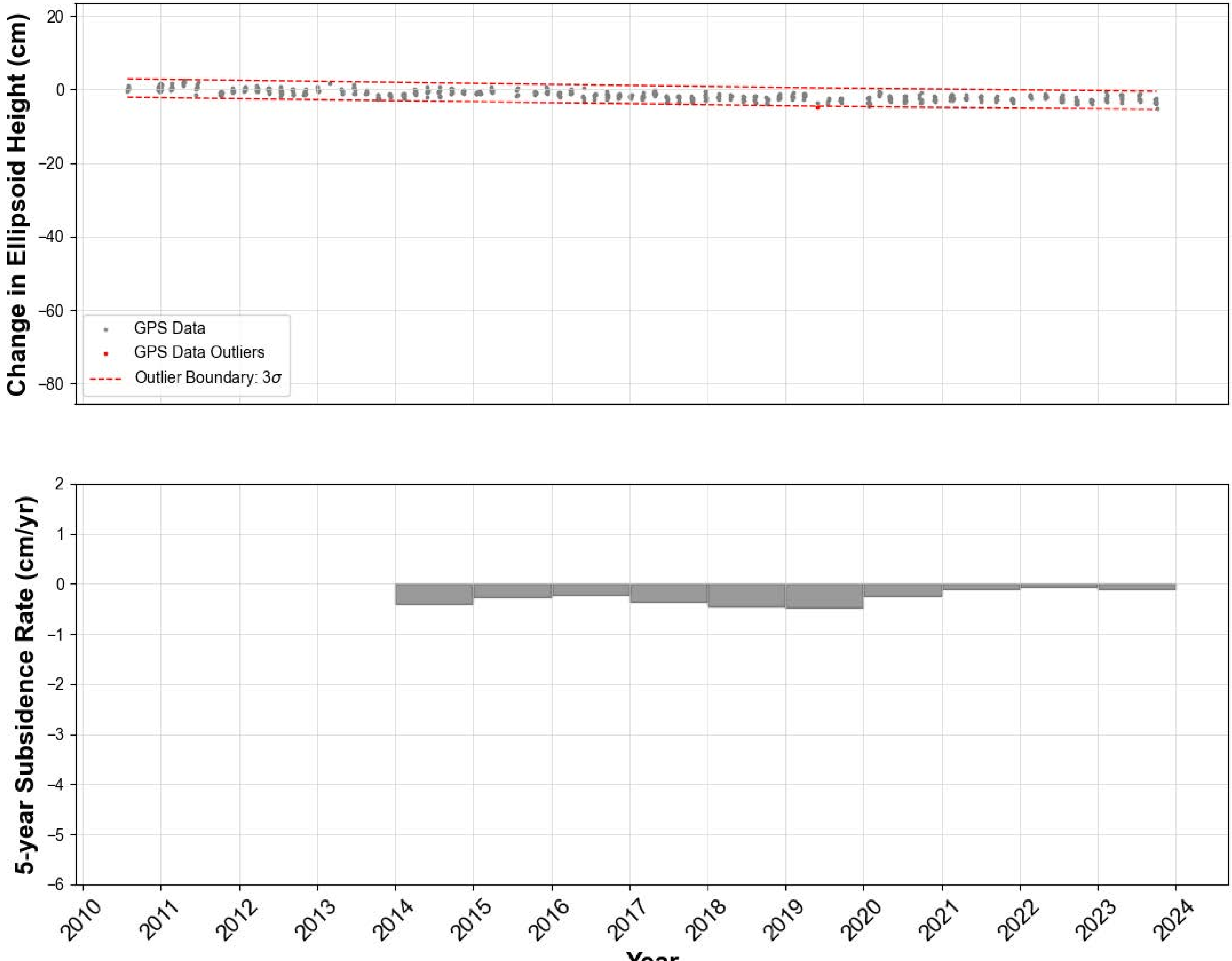
Richmond, TX



Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P059

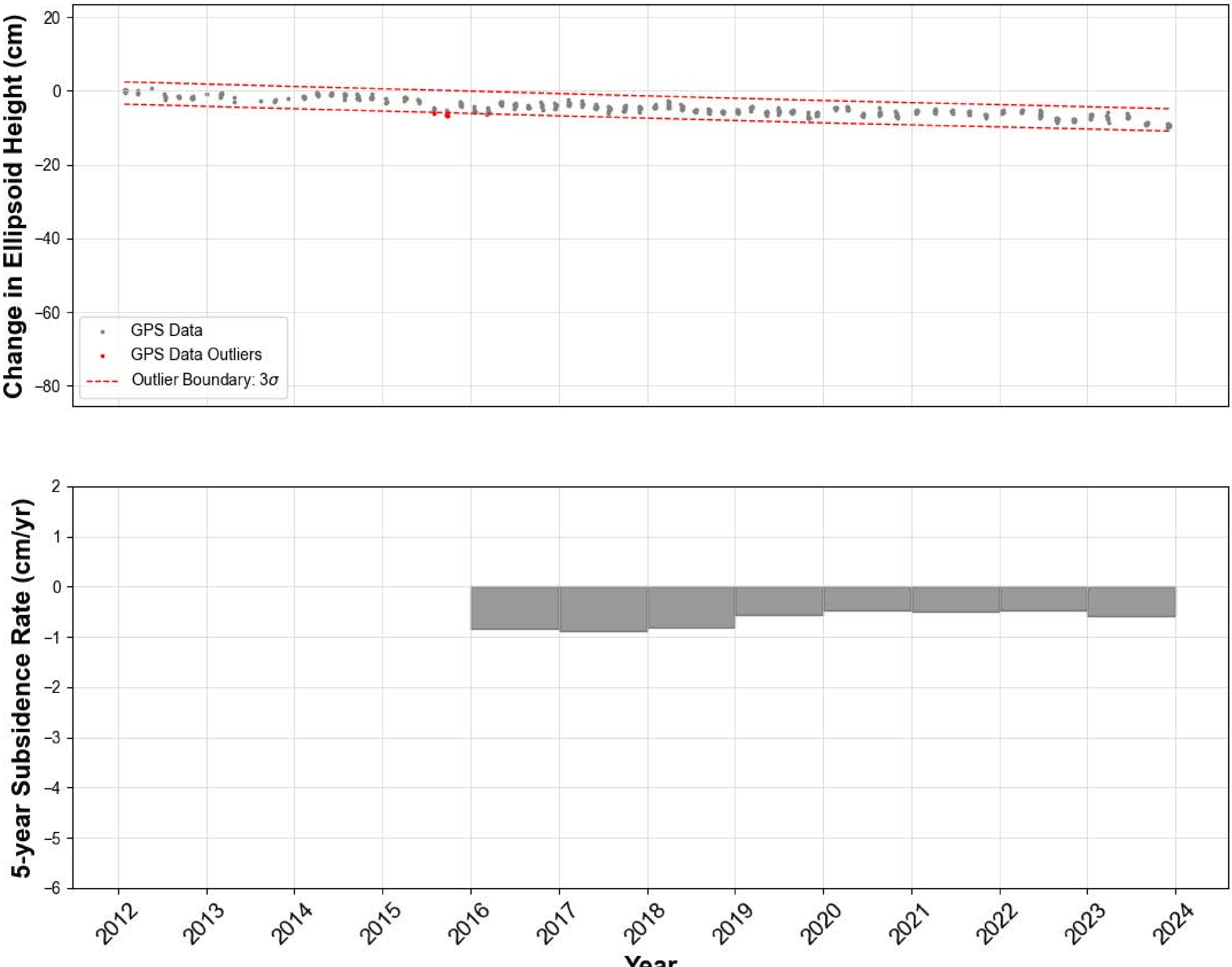
Richmond, TX



Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P060

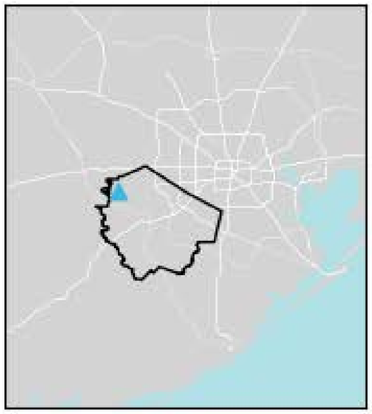
Richmond, TX

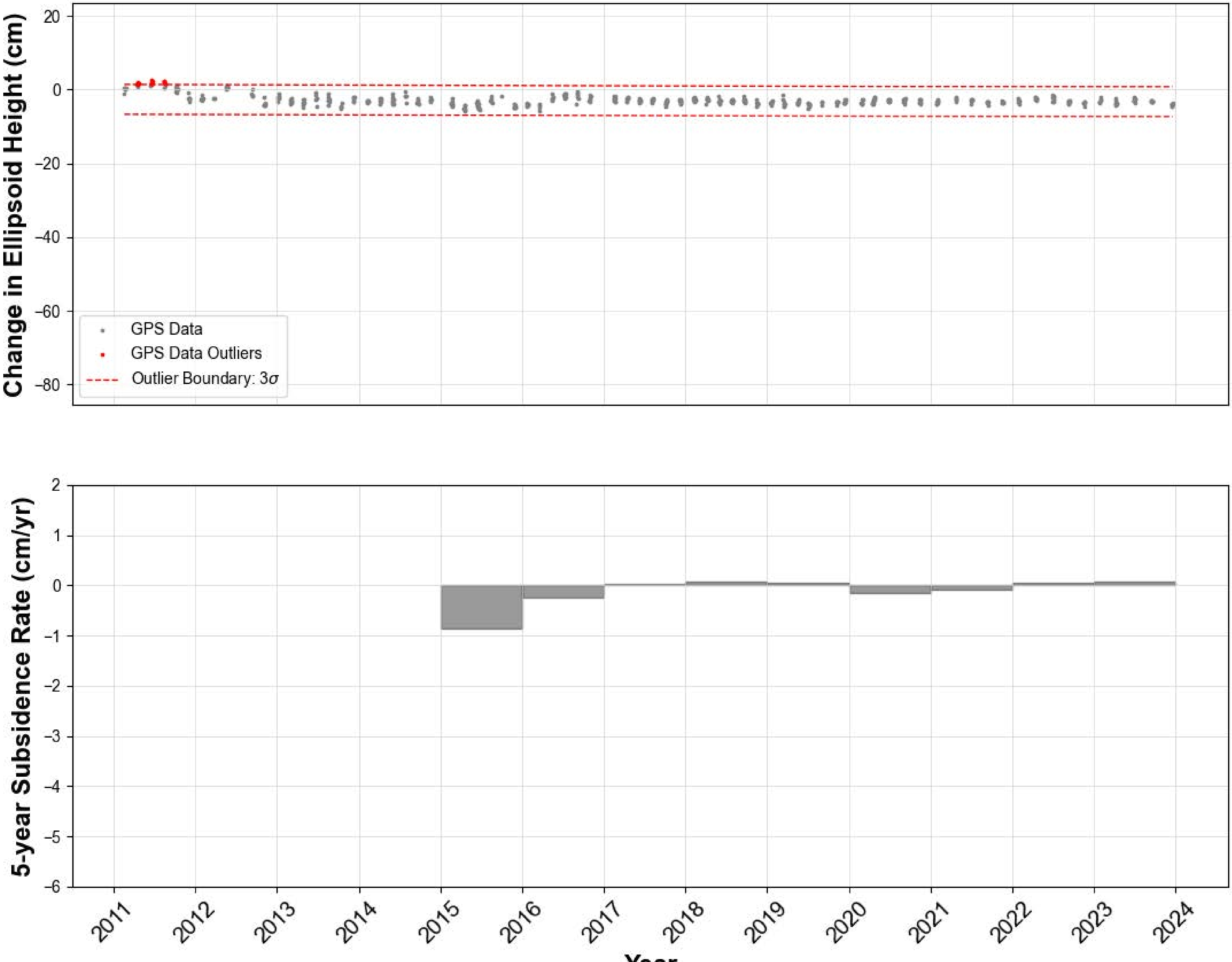


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P061

Simonton, TX

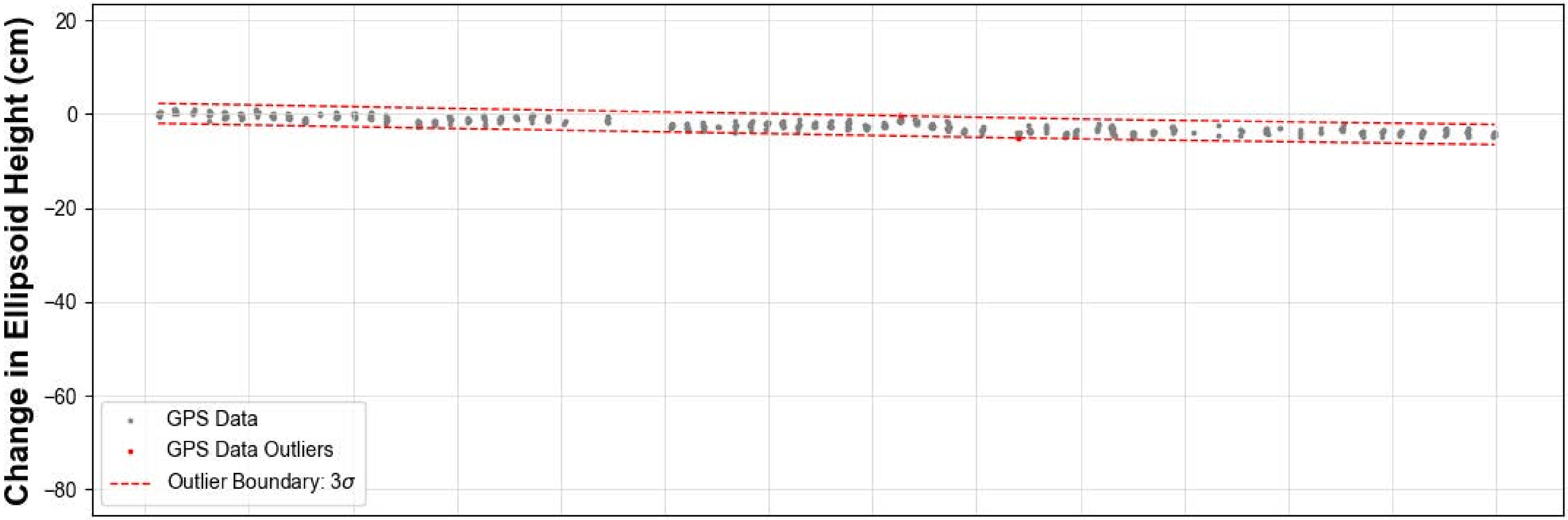


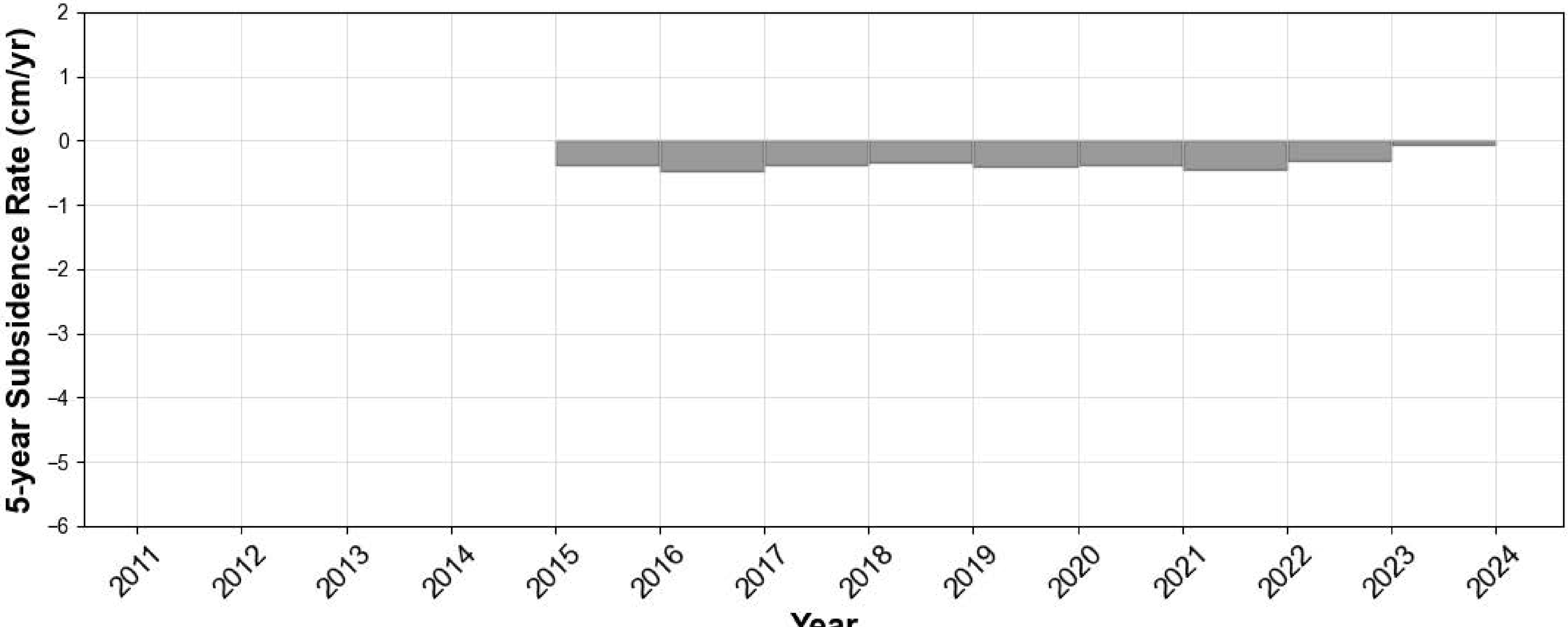


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P062

Rosenberg, TX

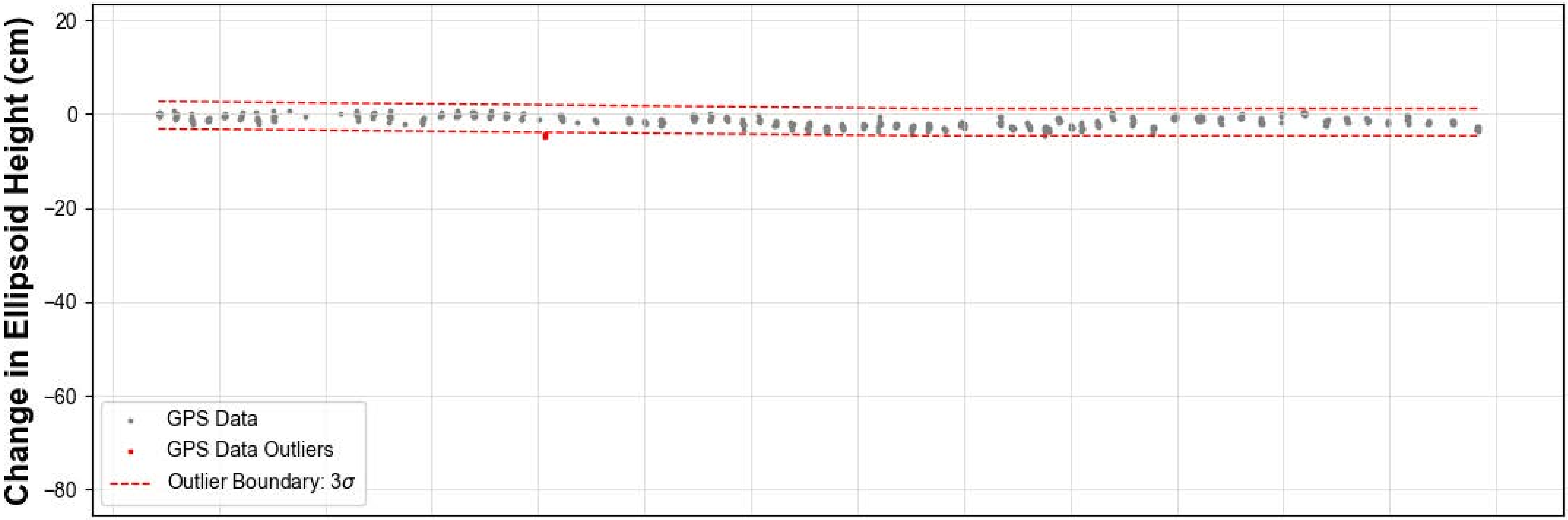


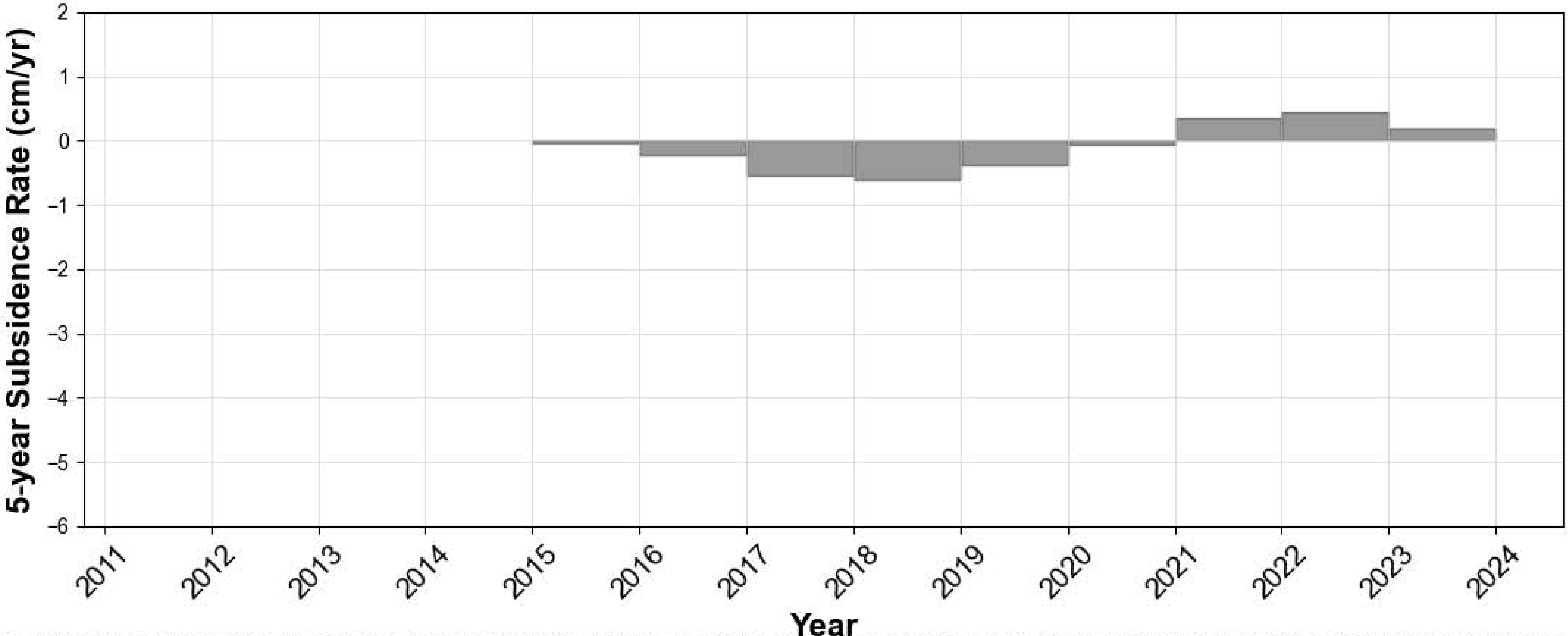


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P063

Missouri City, TX

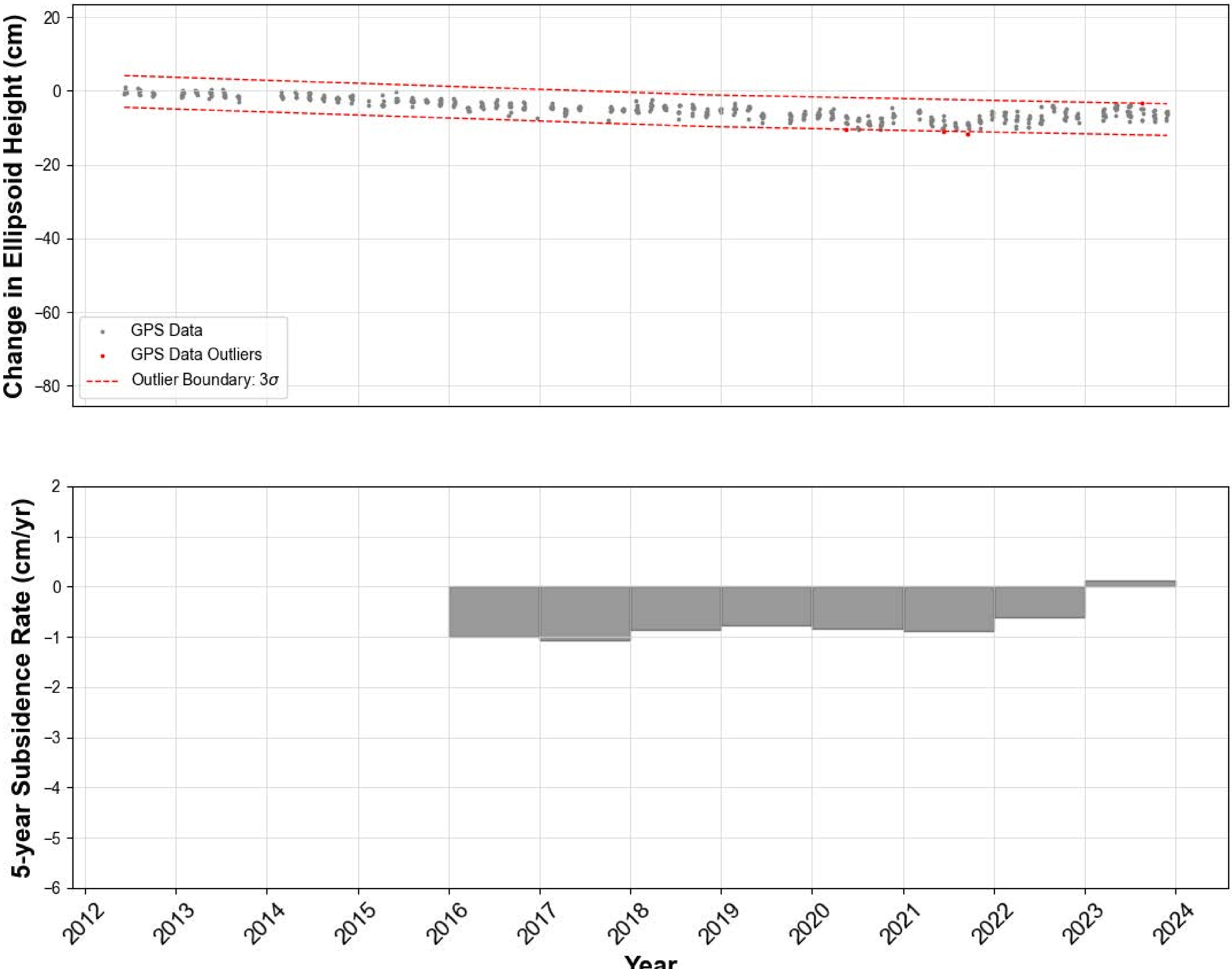




Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P065

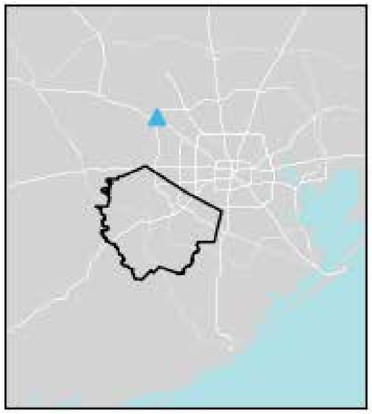
Huffman, TX

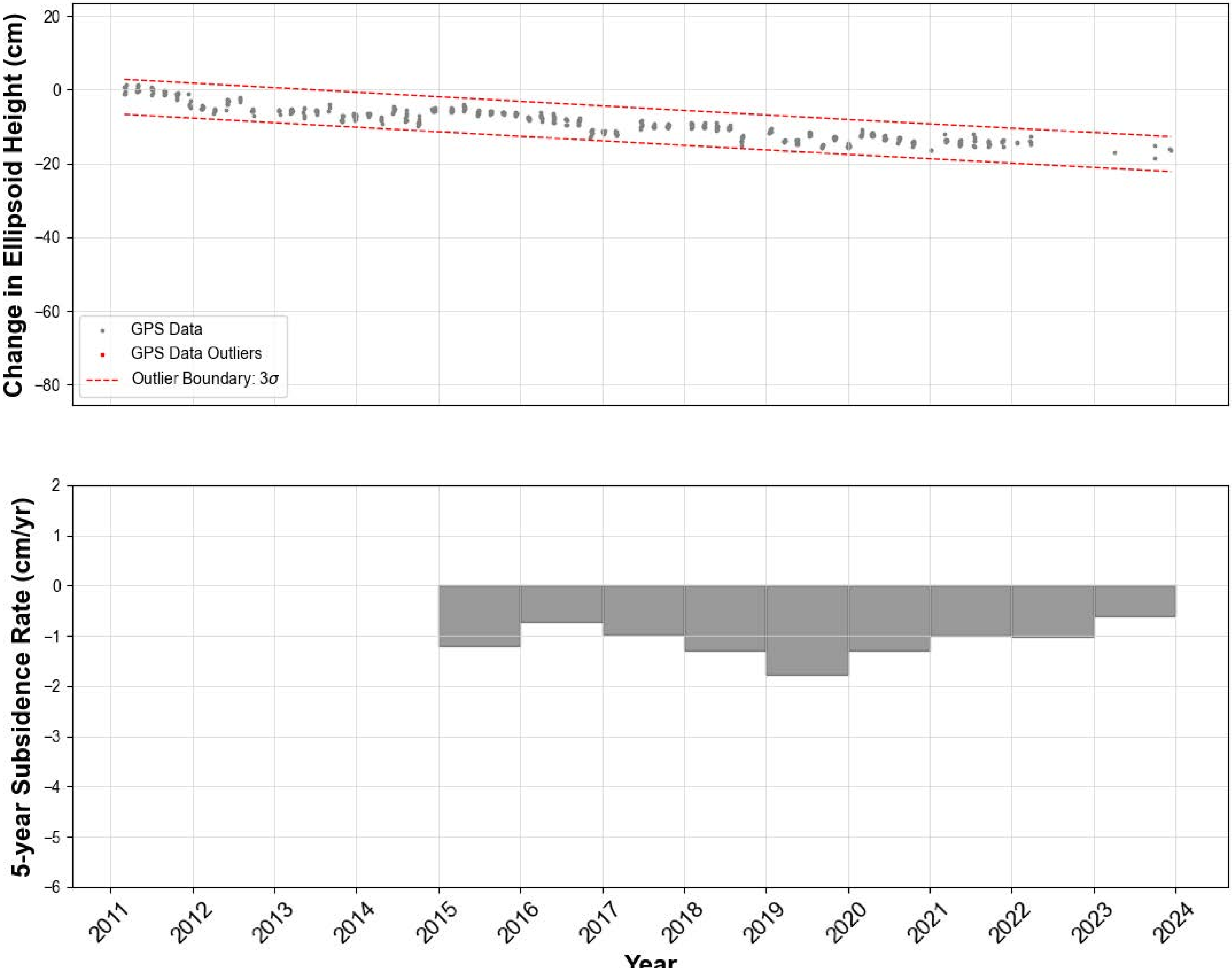


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P066

Cypress, TX

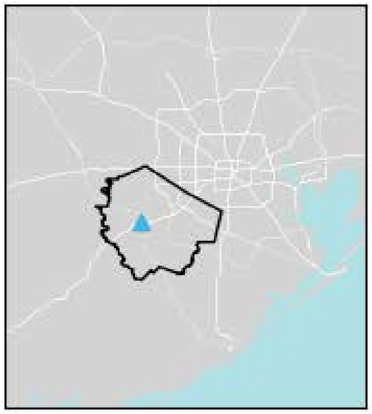


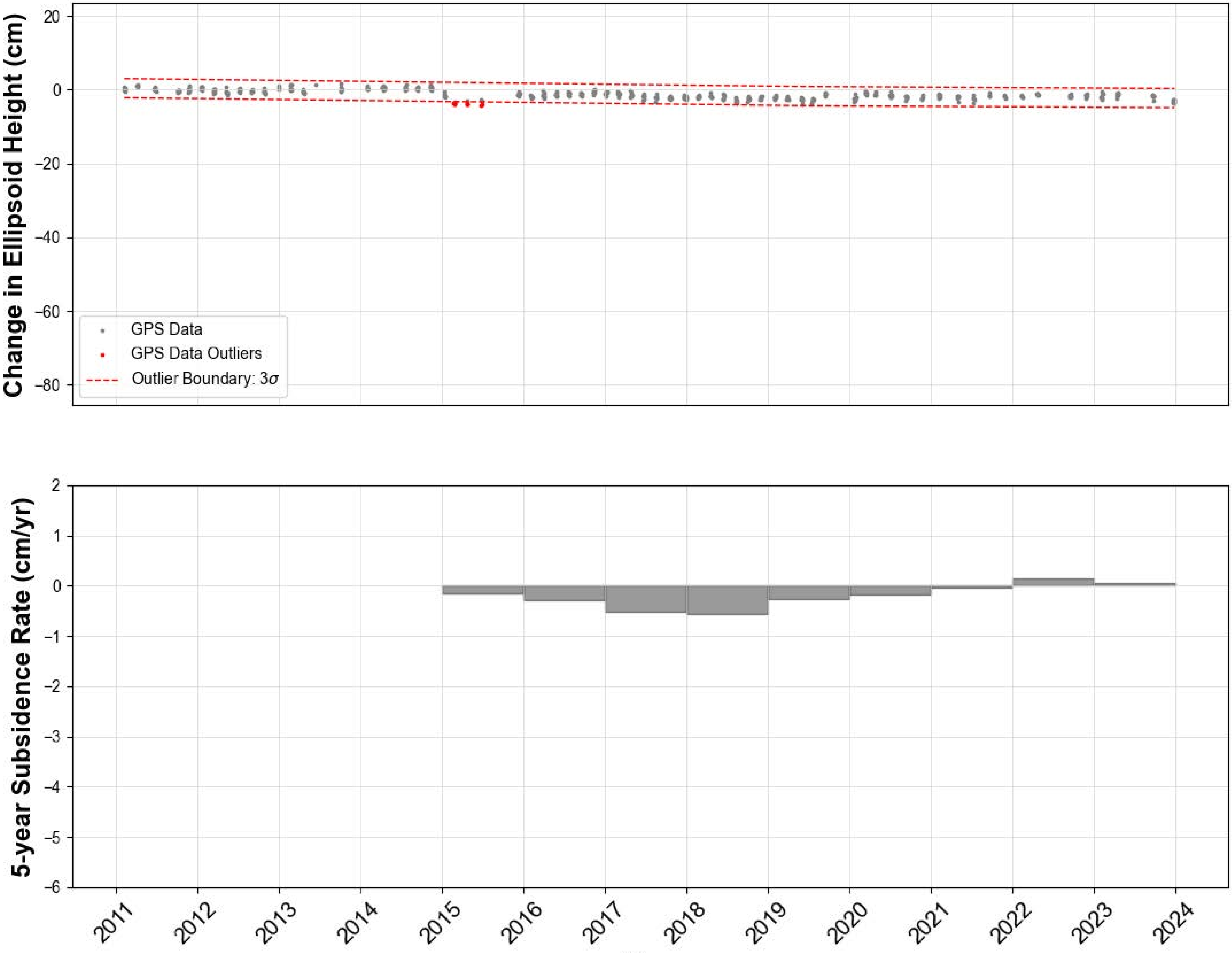


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P067

Rosenberg, TX

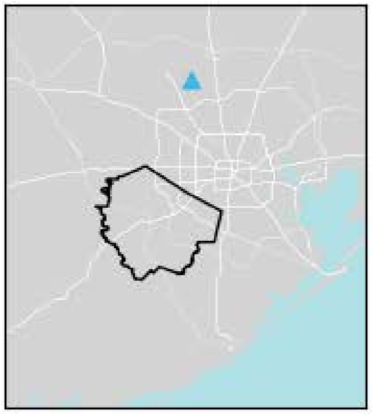


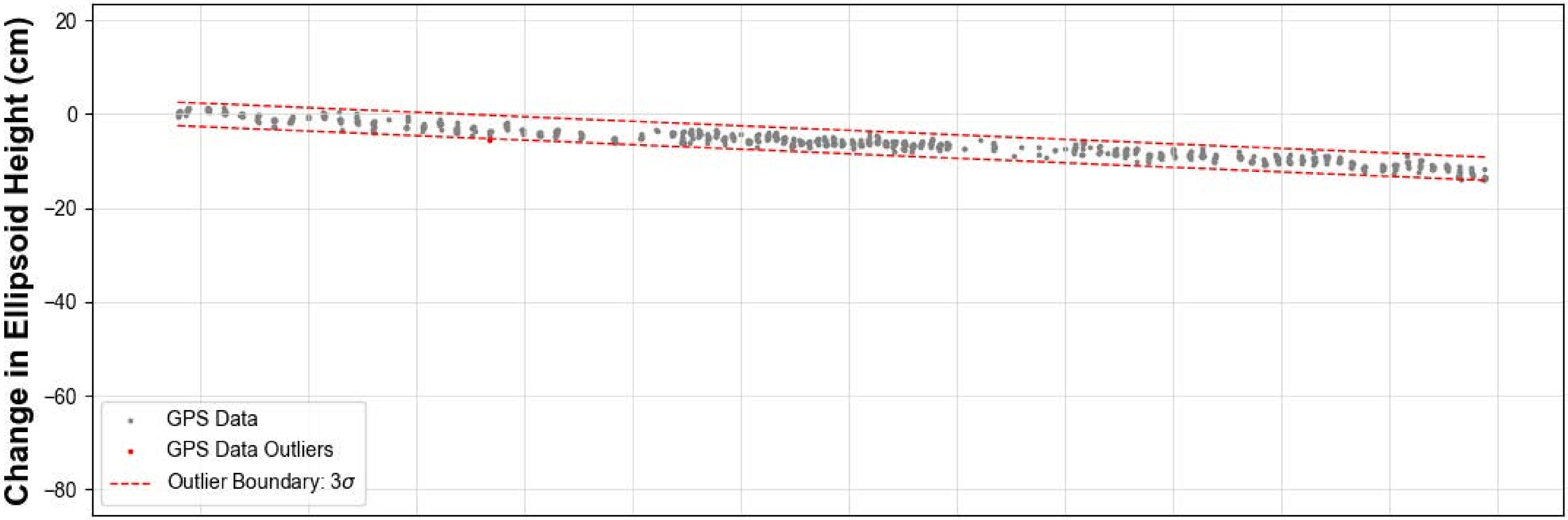


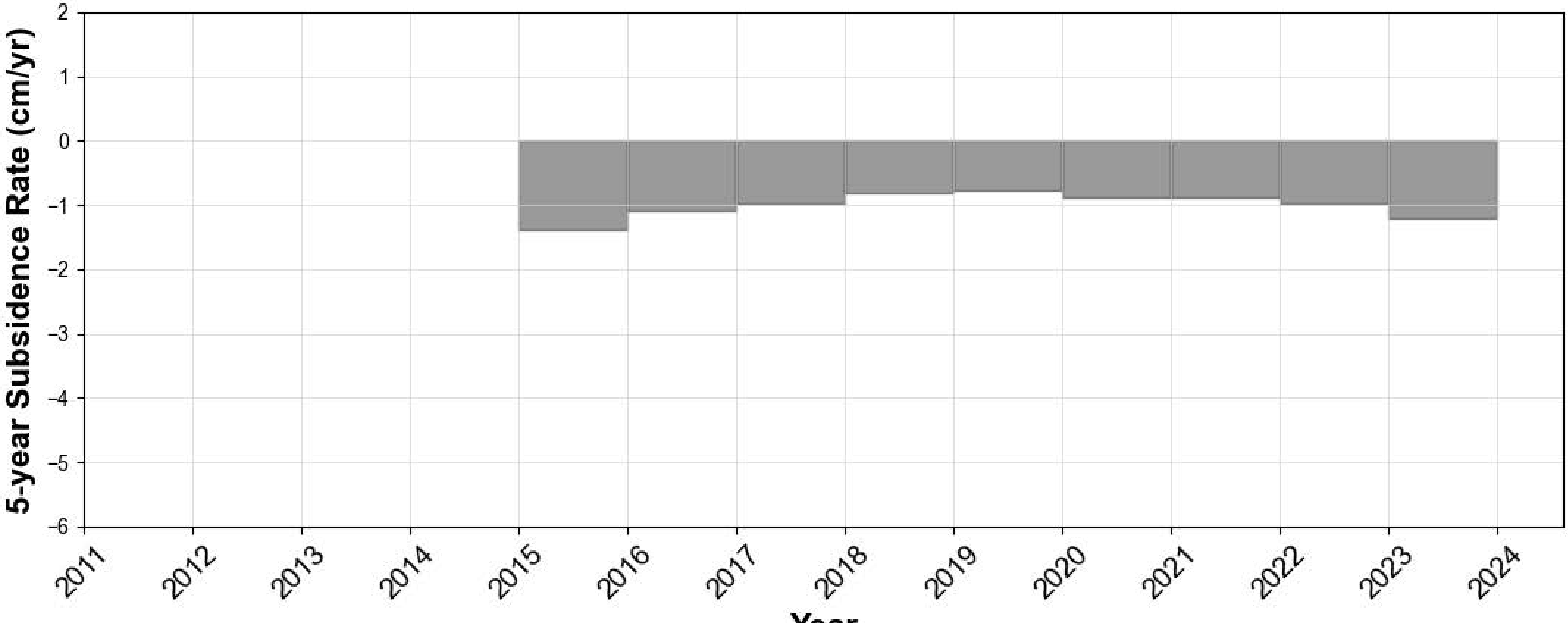
Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P068

The Woodlands, TX



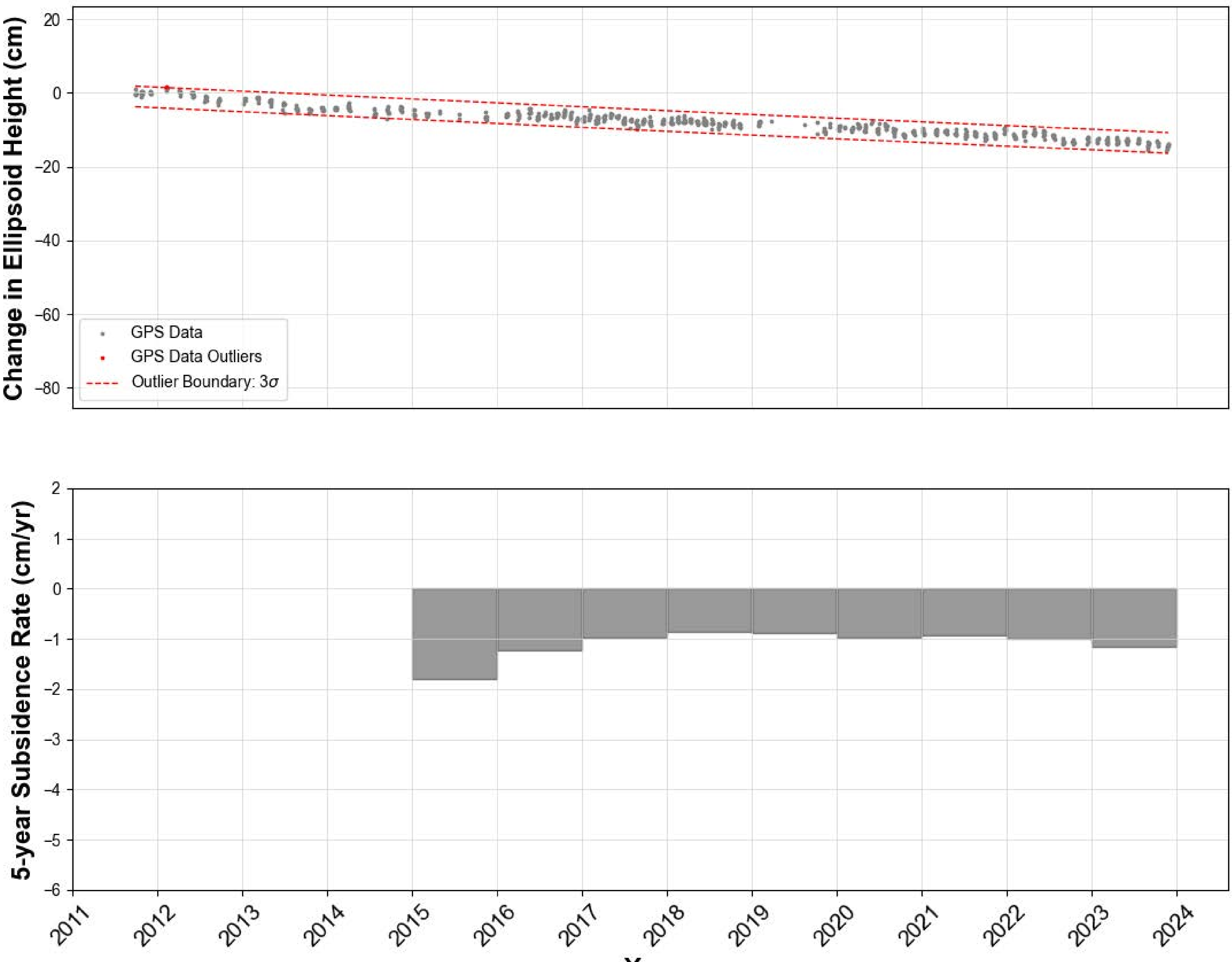




Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P069

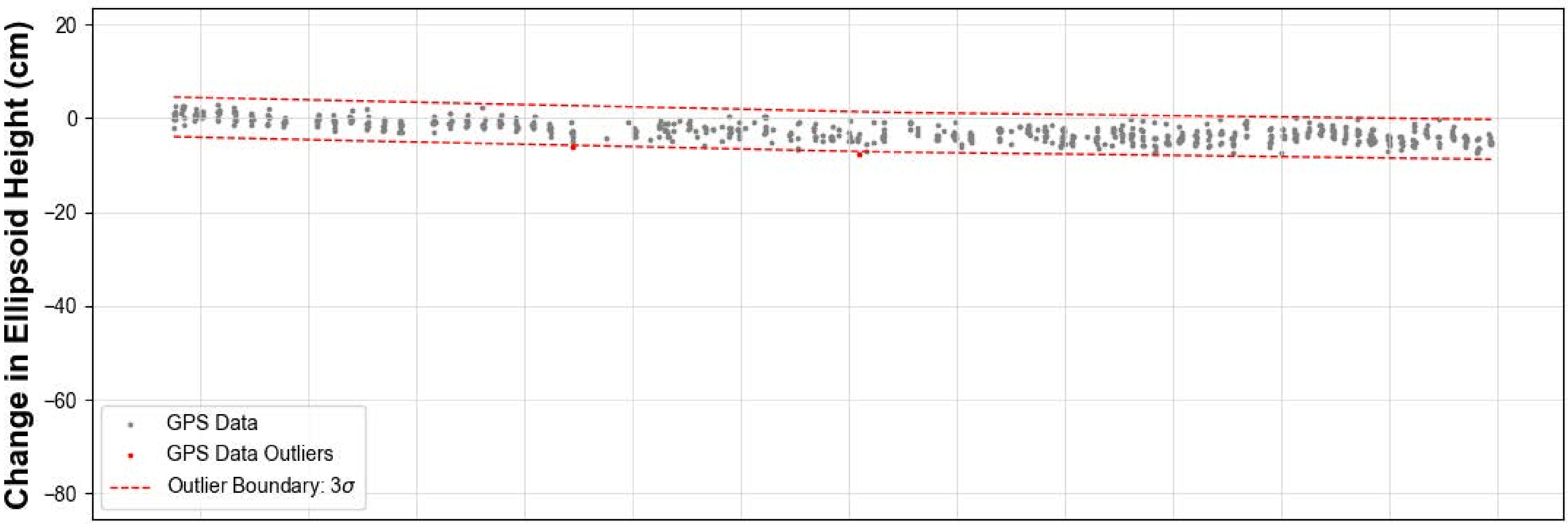
Conroe, TX

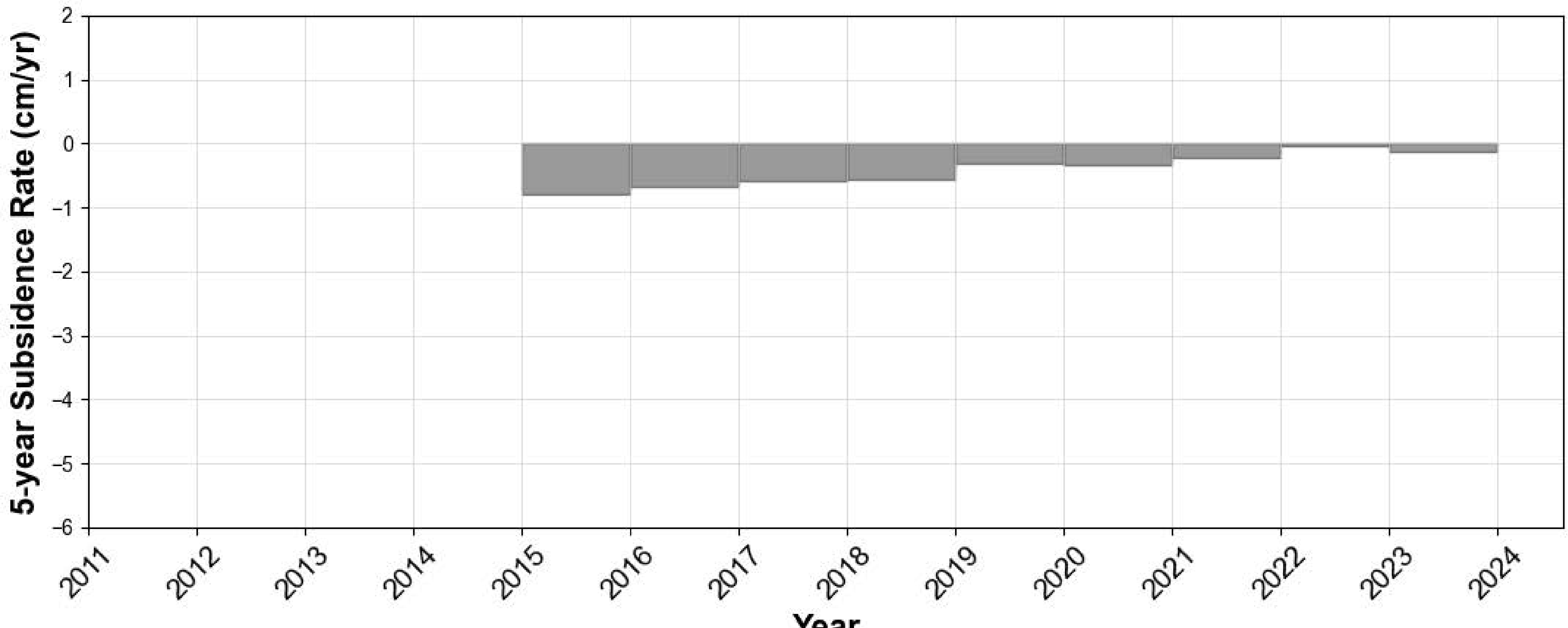


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P070

Conroe, TX

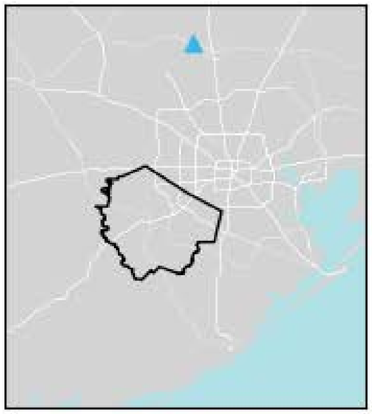


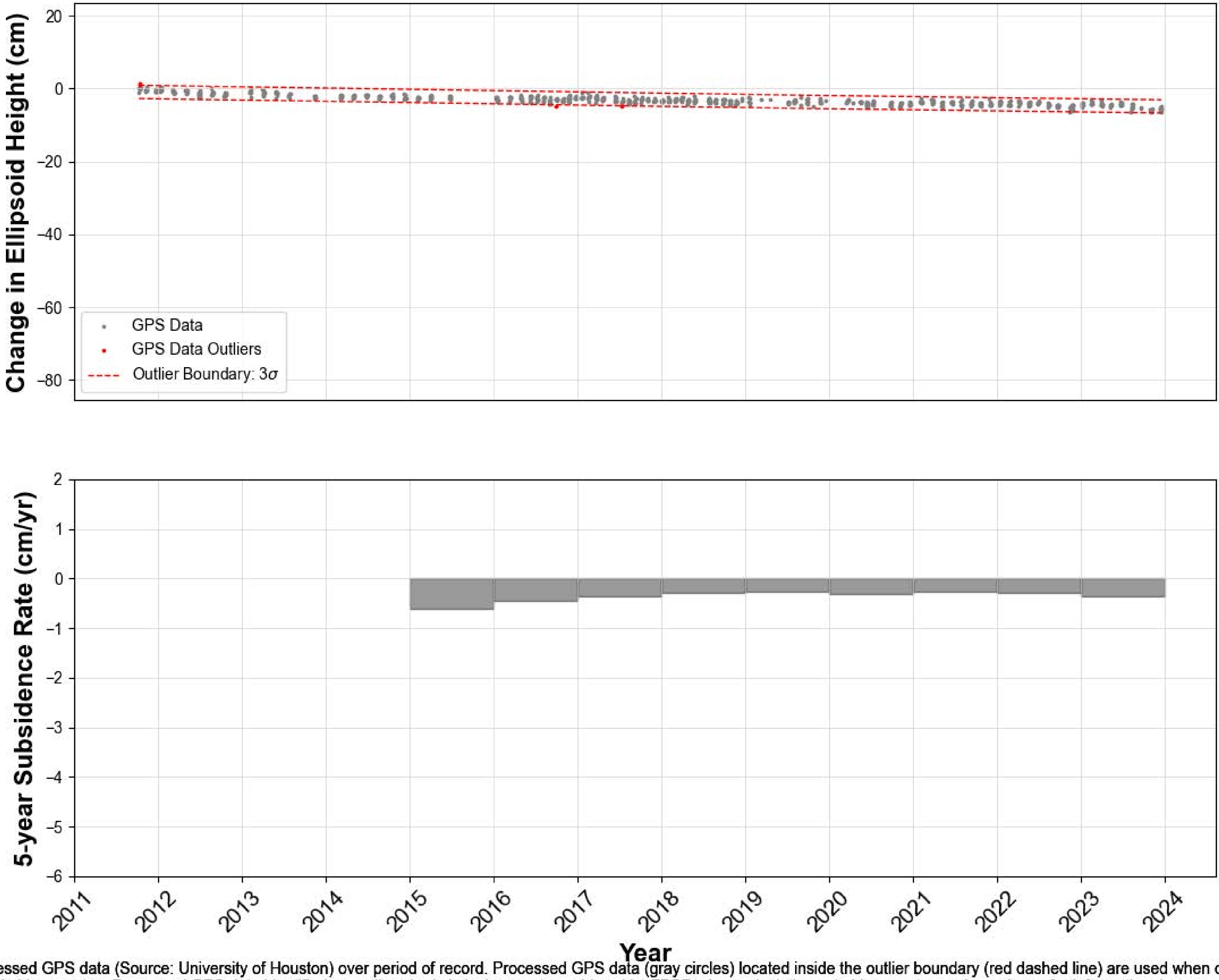


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

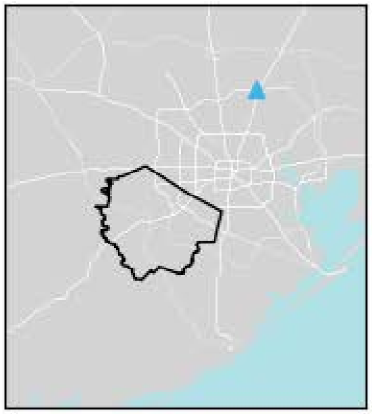
P071

Conroe, TX



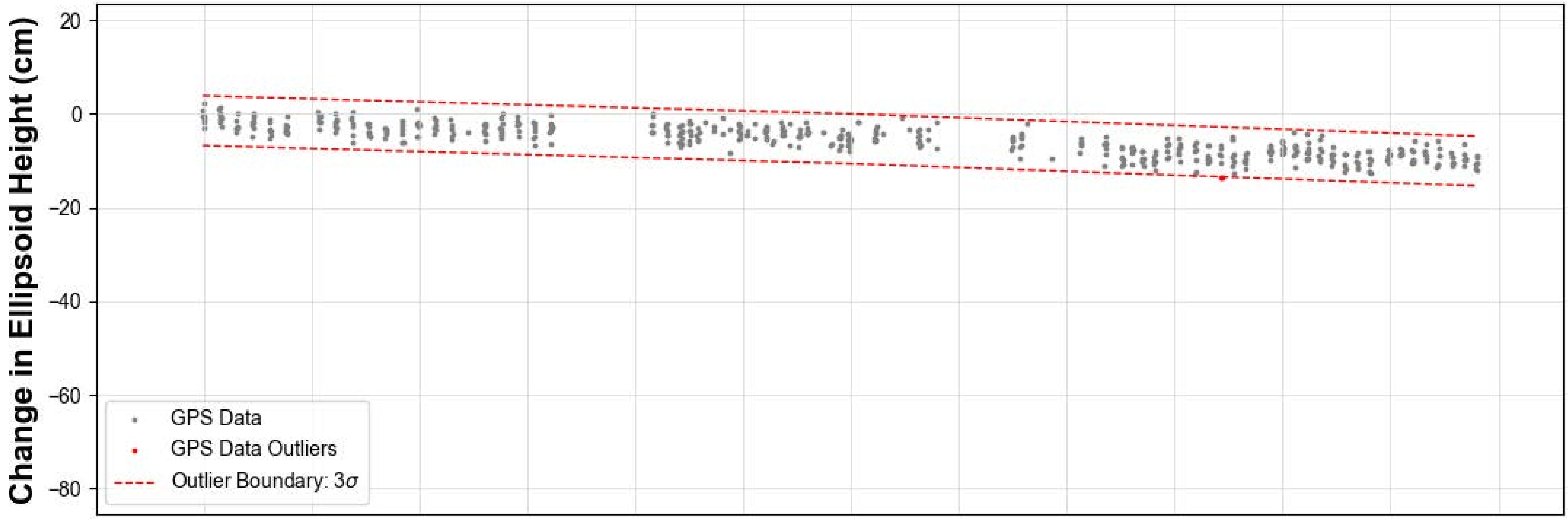


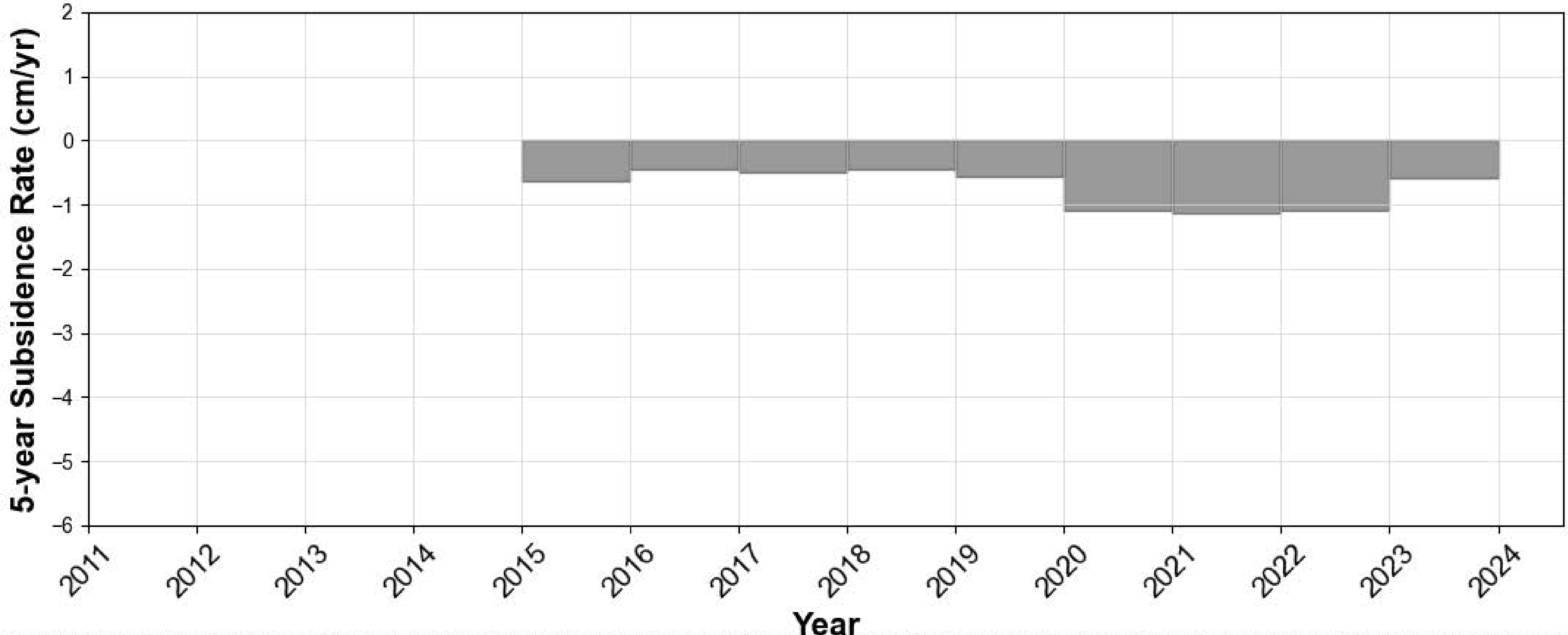
Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.



P072

New Caney, TX

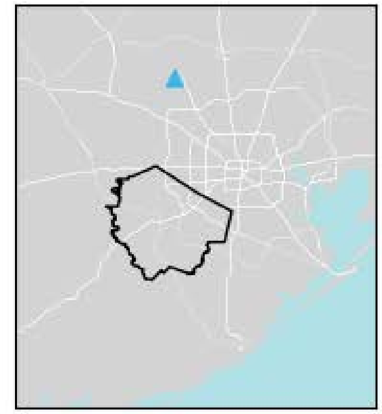


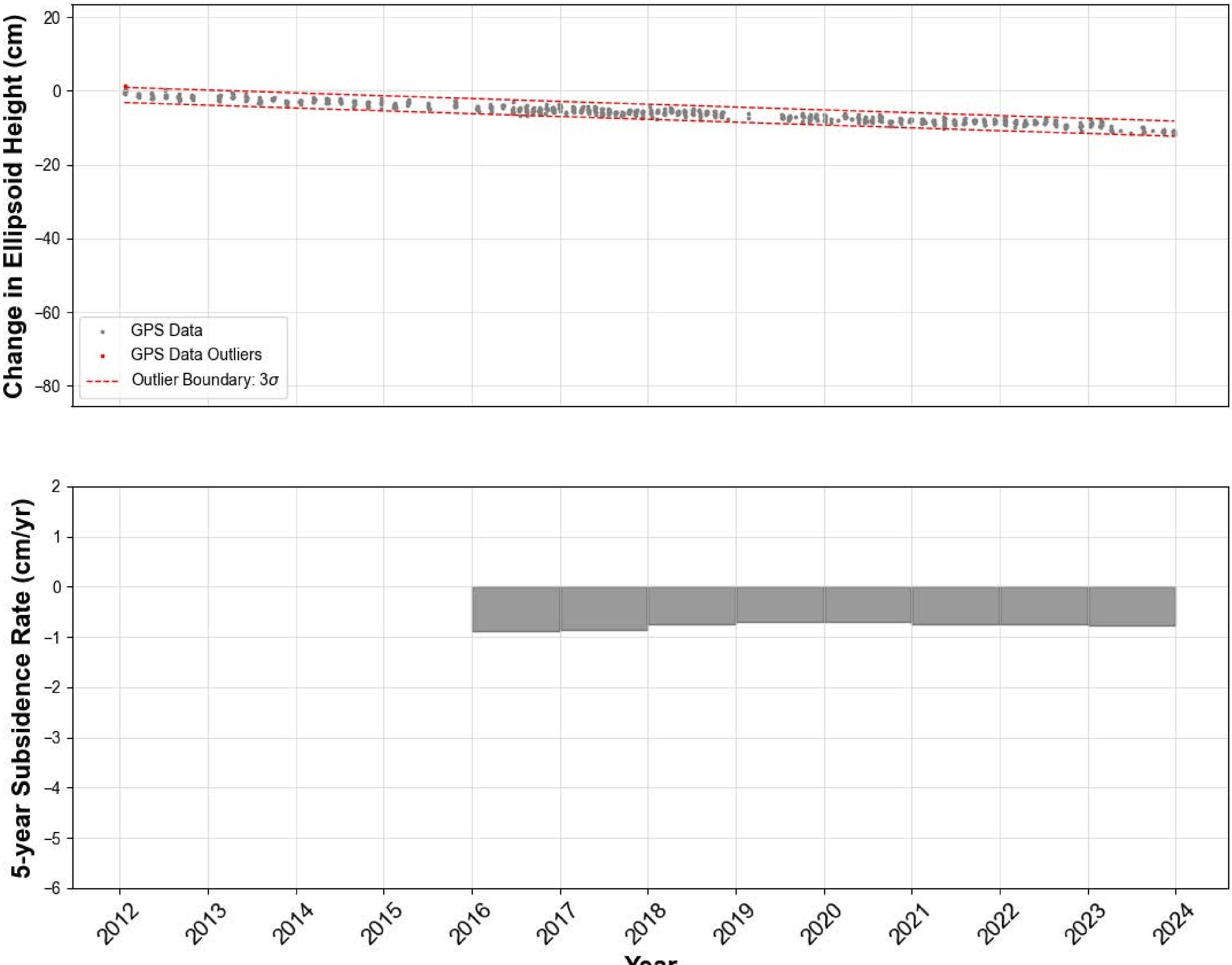


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P073

Magnolia, TX

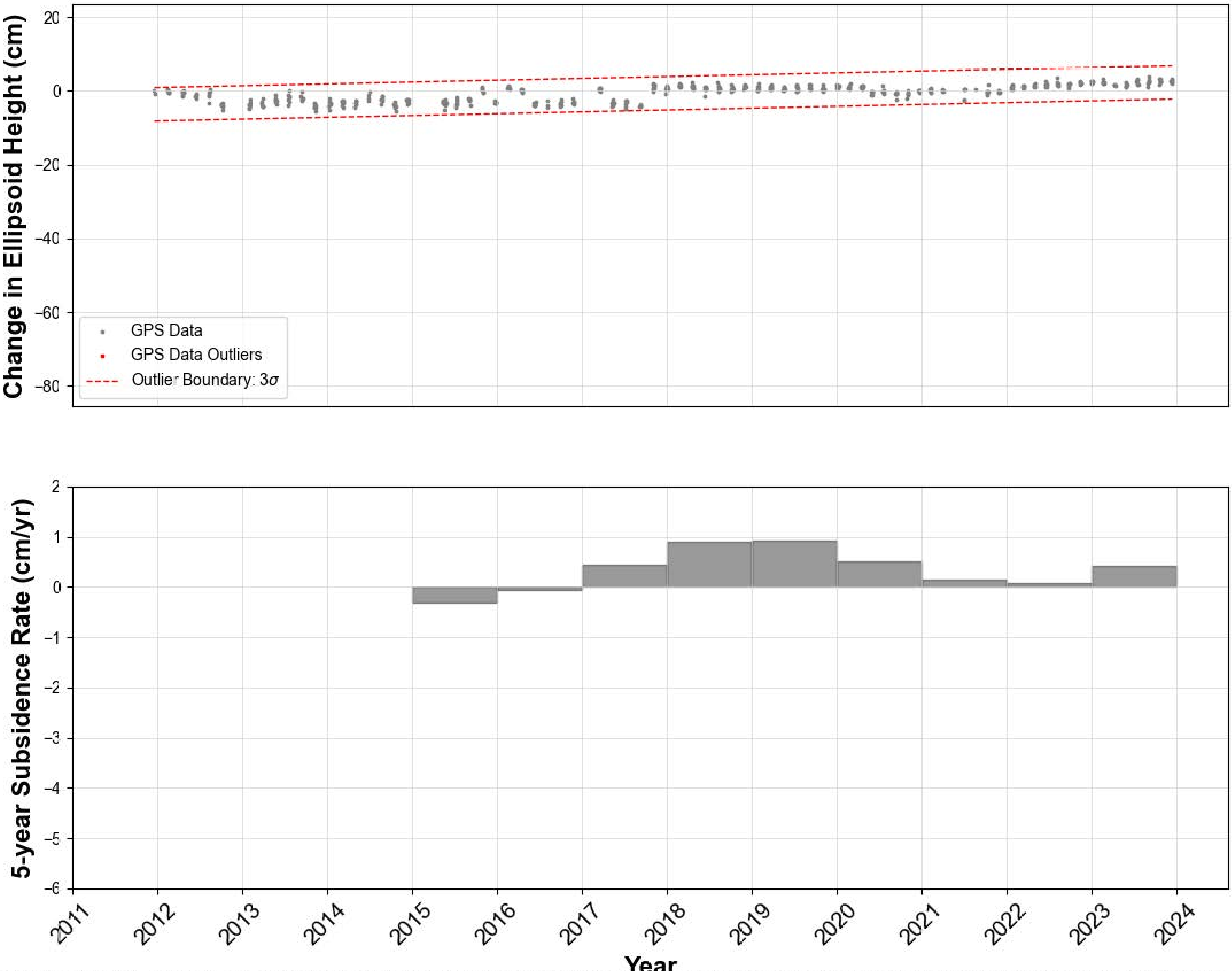




Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P074

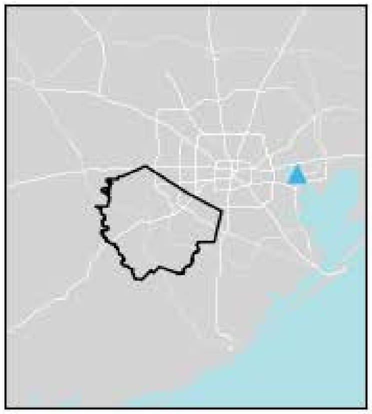
Galena Park, TX

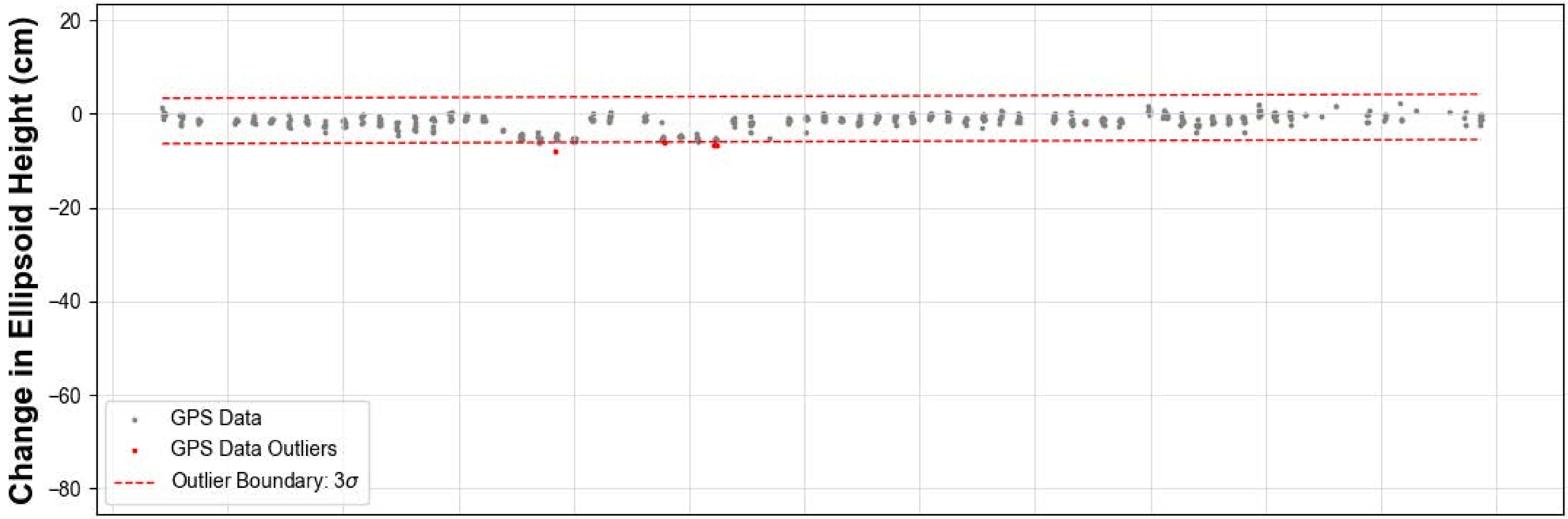


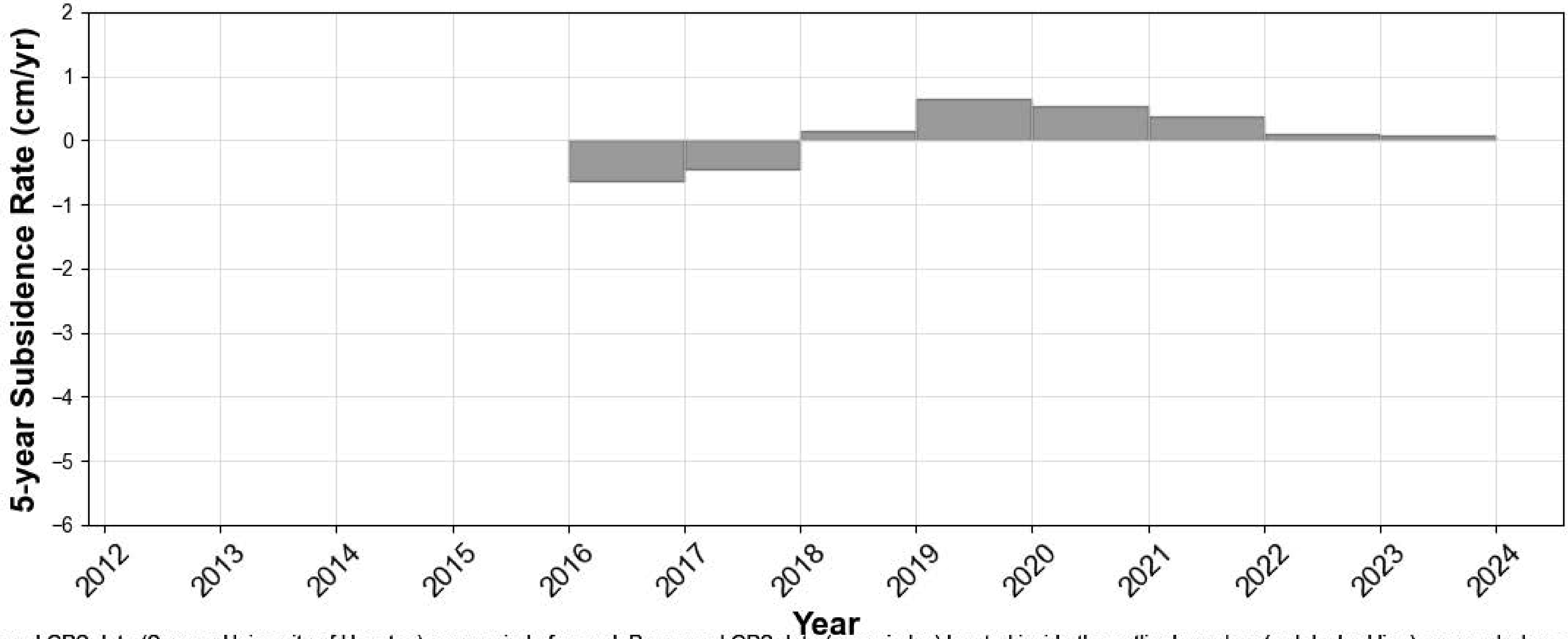
Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P075

Baytown, TX



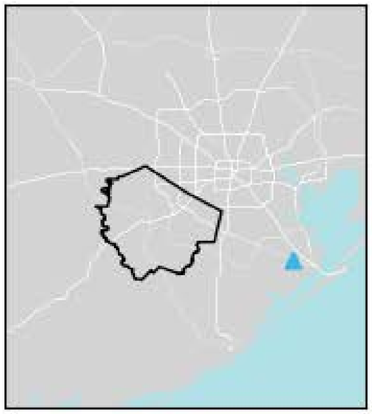


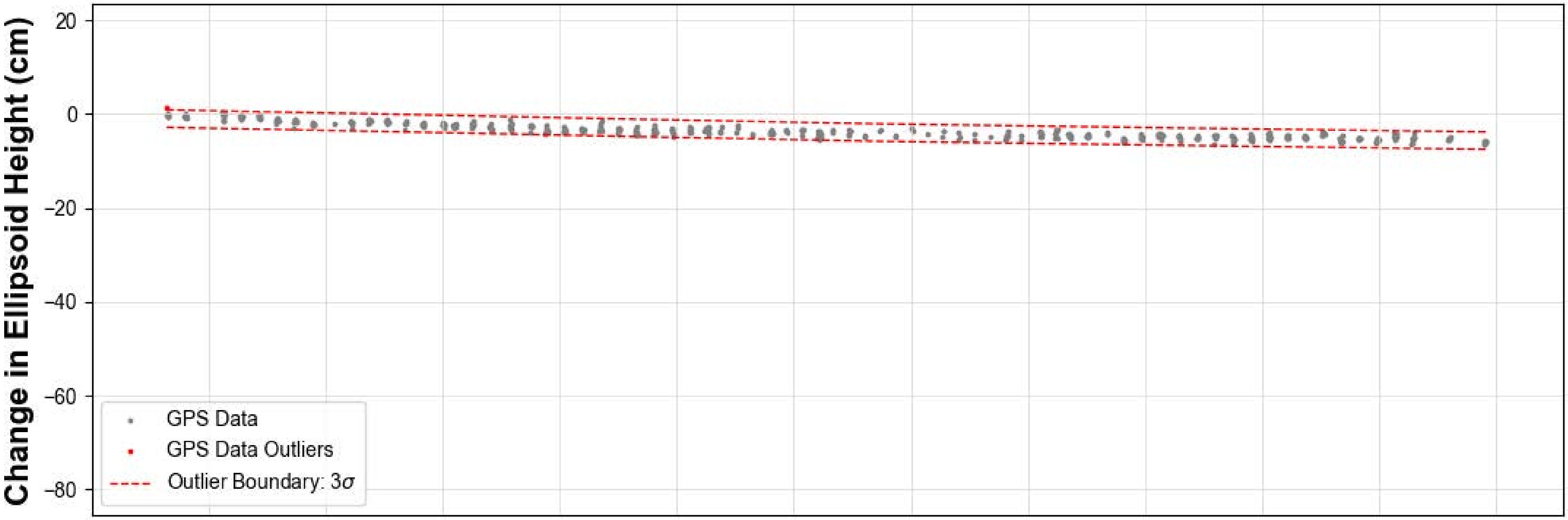


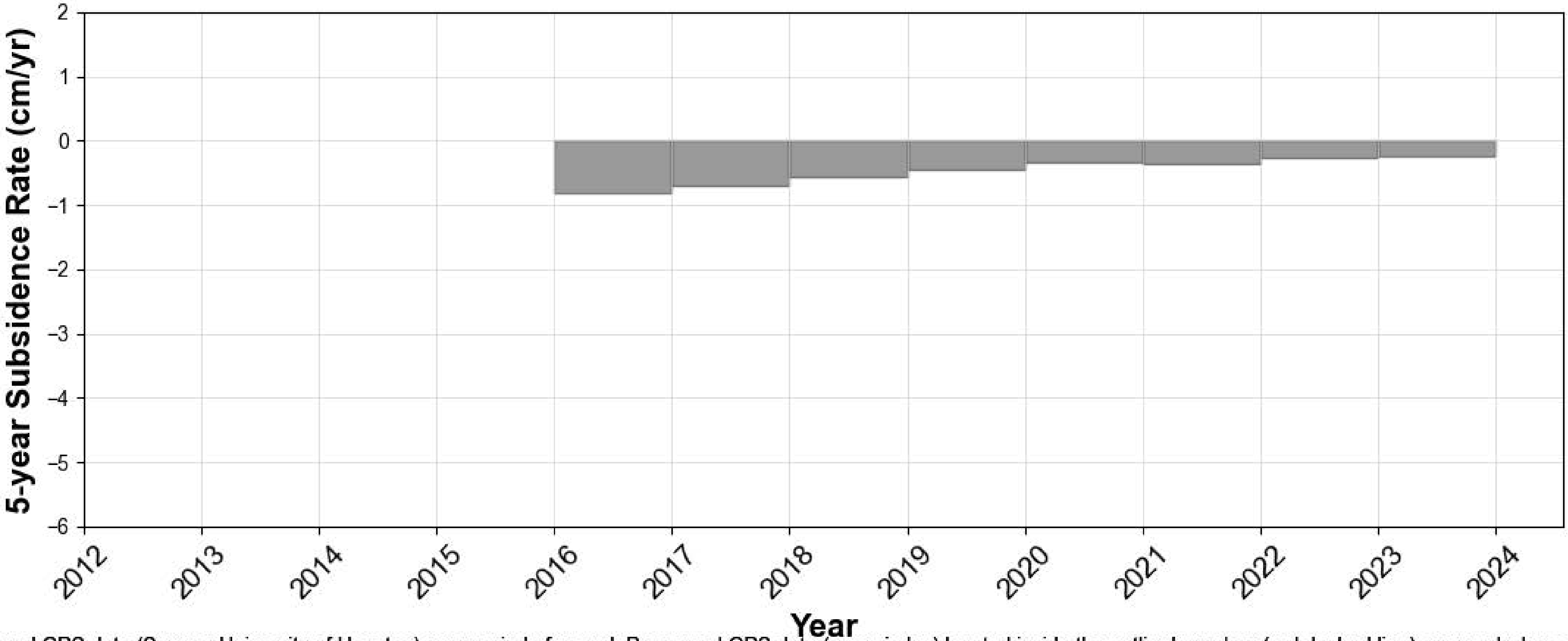
Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P076

Hitchcock, TX



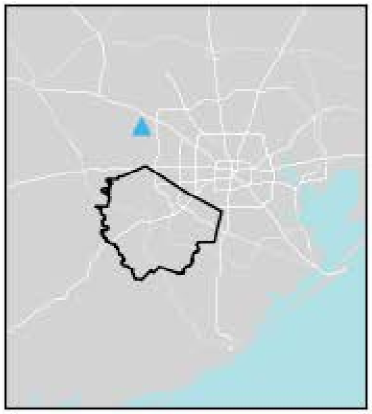


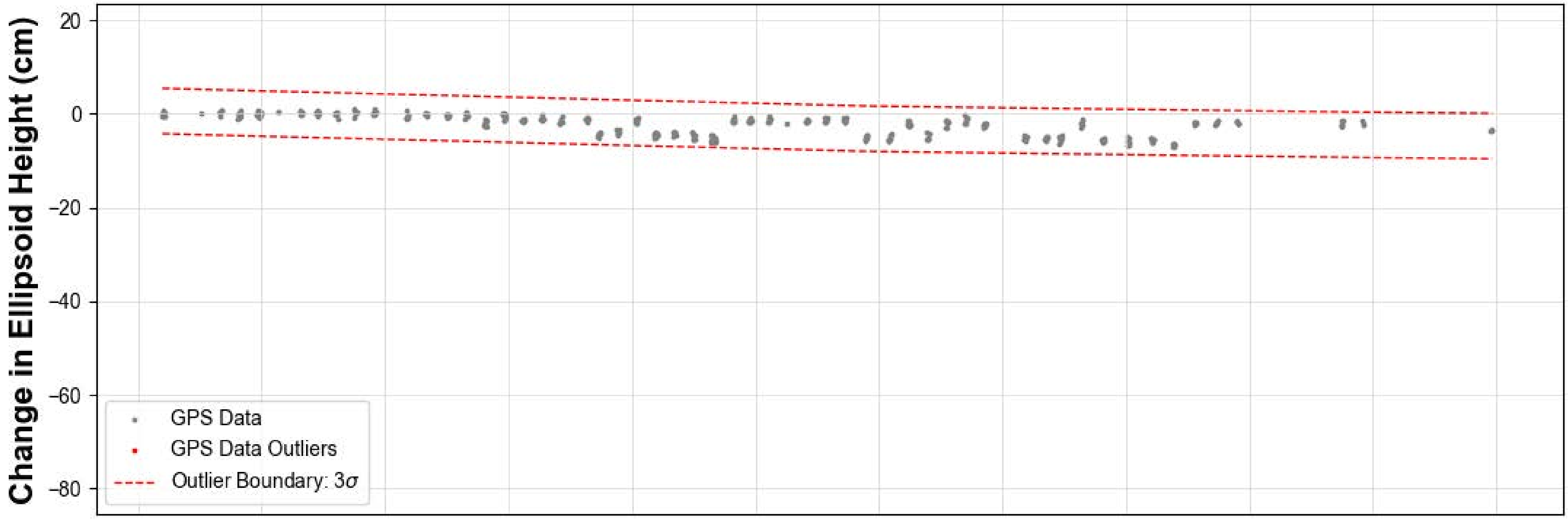


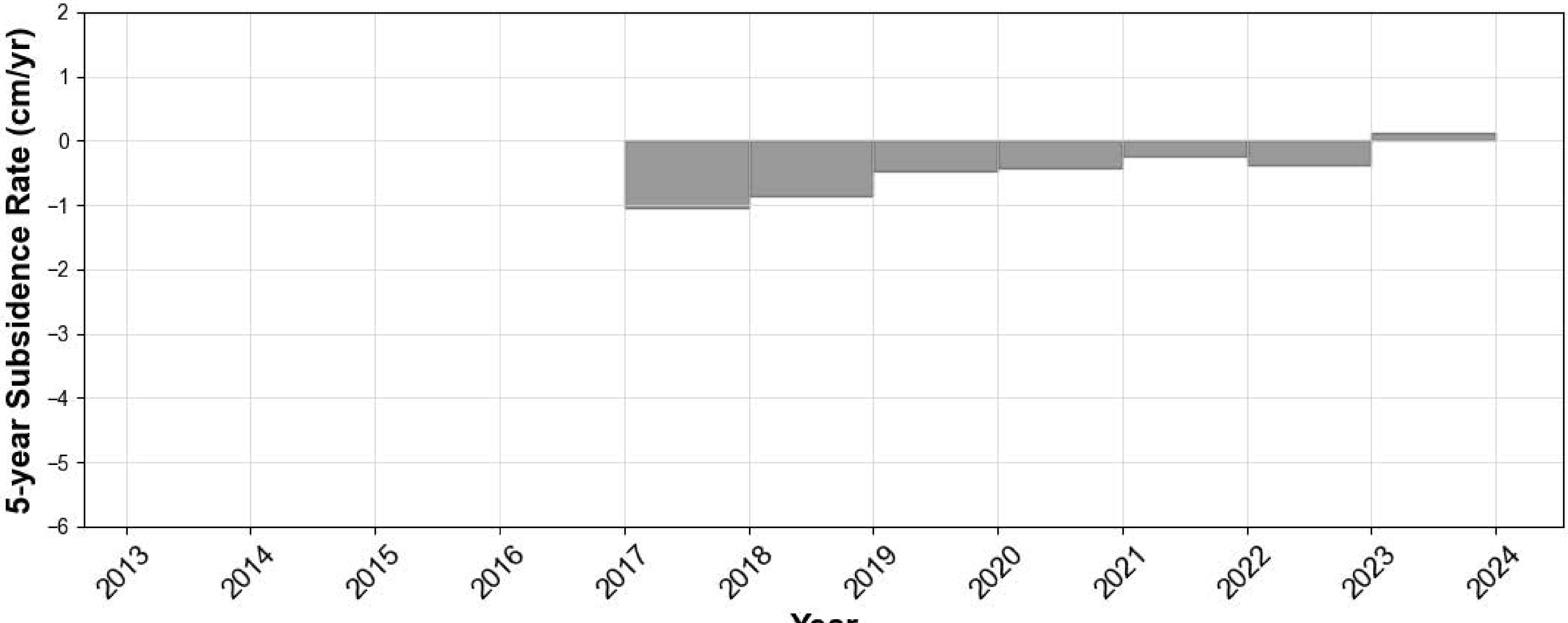
Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P077

Hockley, TX



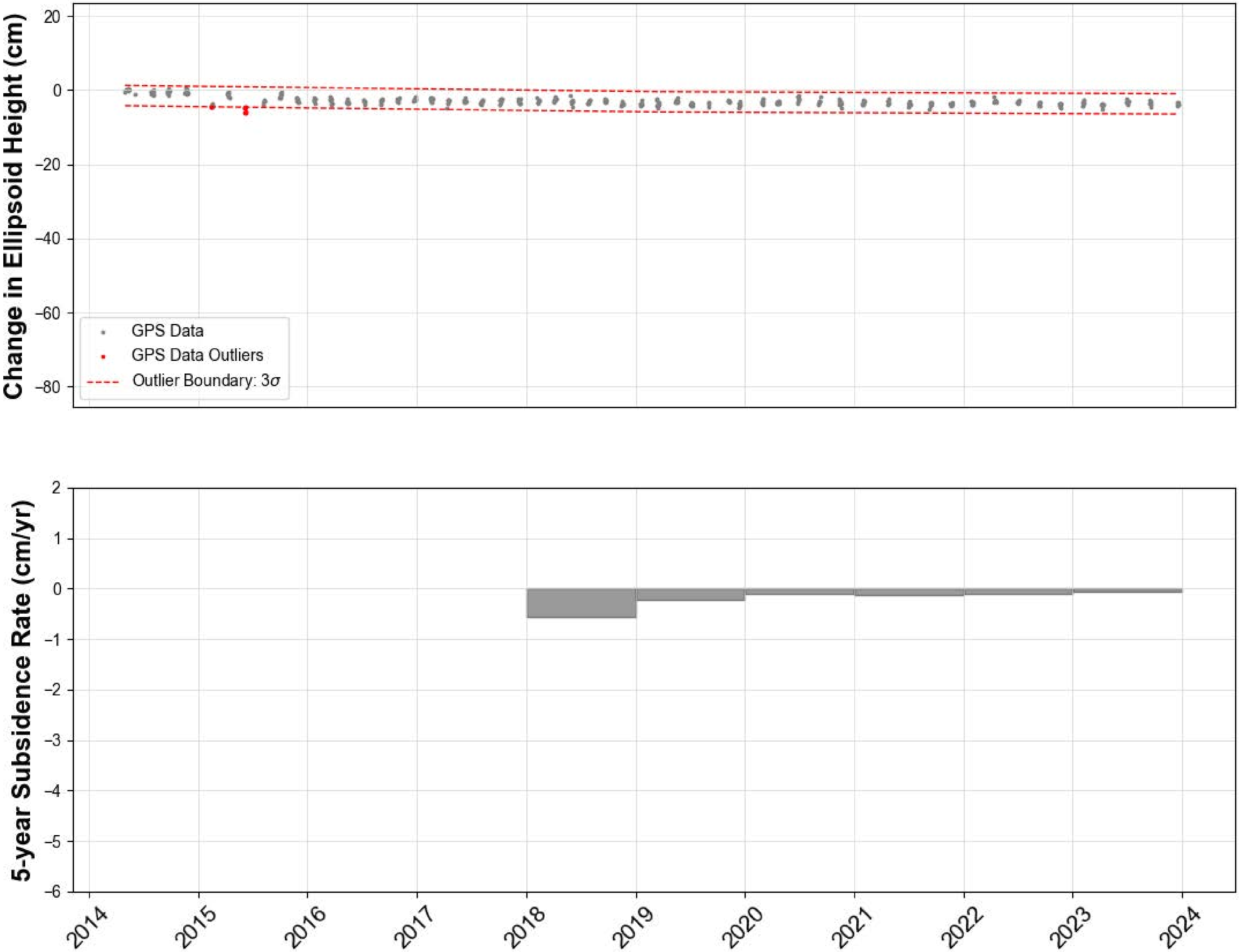




Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P078

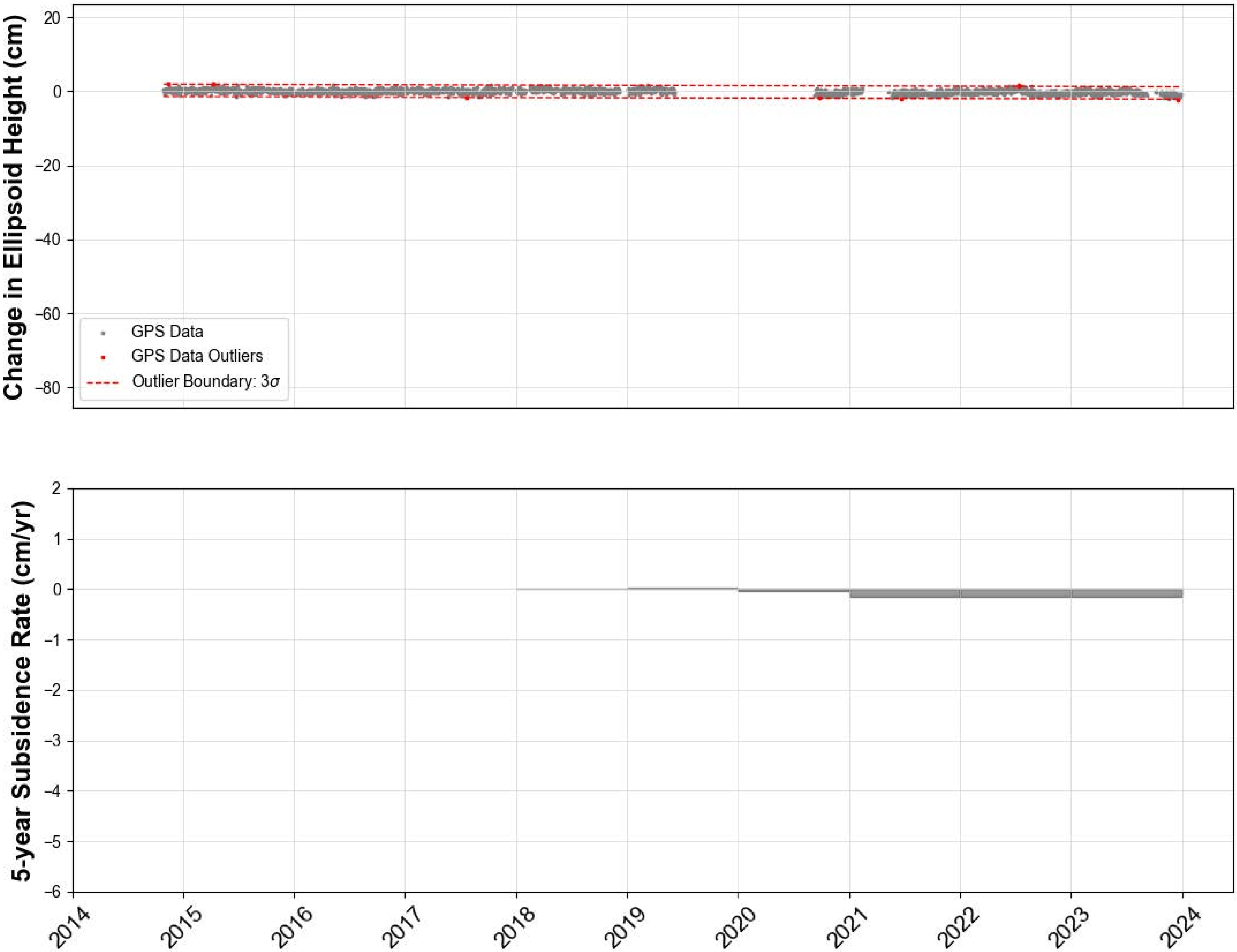
Brazos Country, TX



Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P079

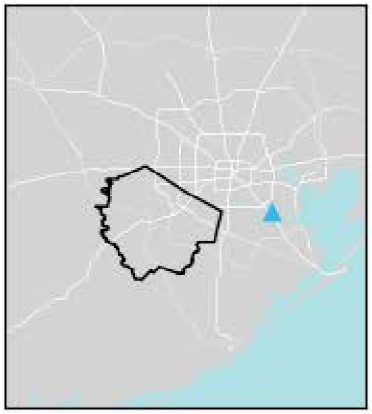
Lake Jackson, TX

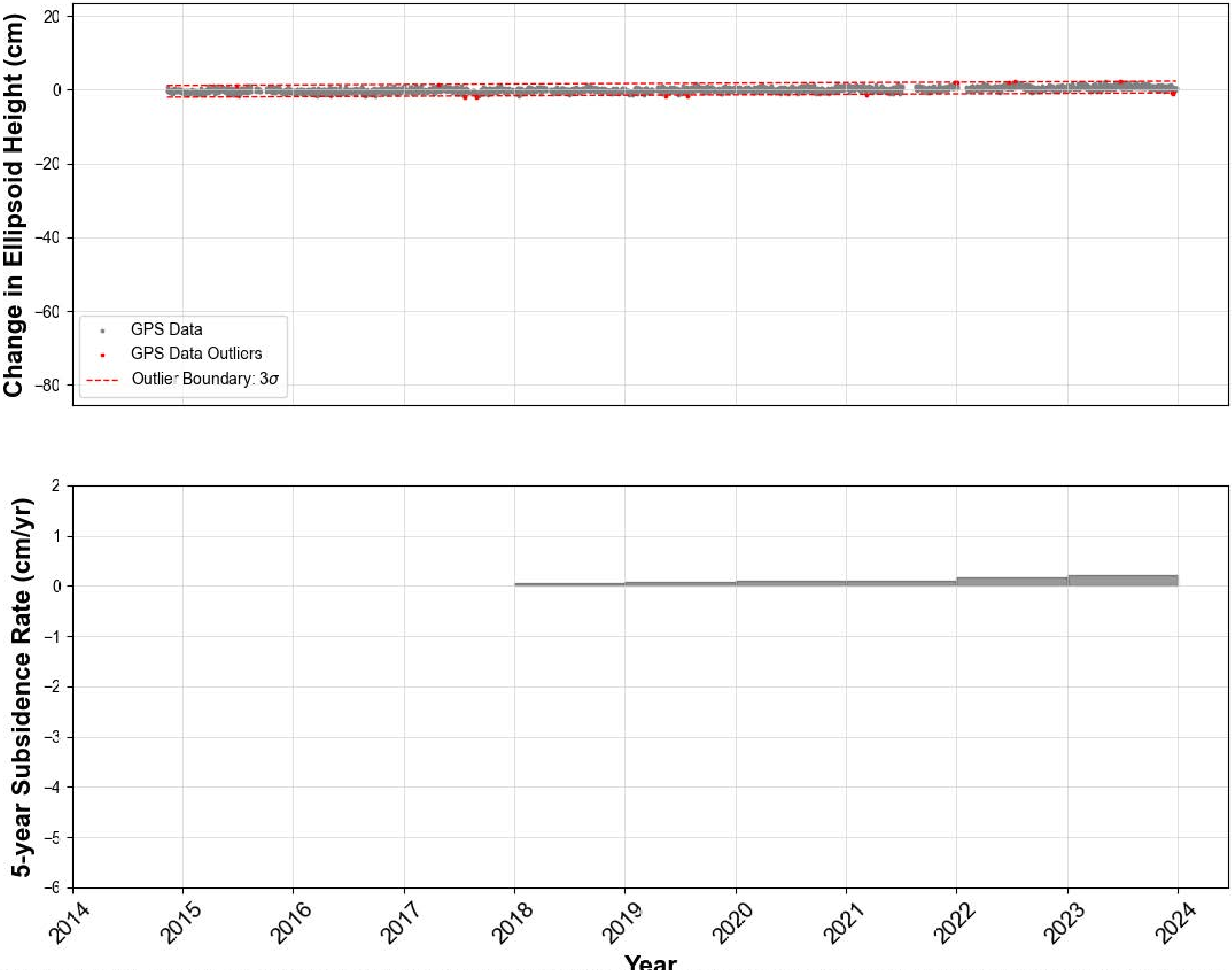


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P080

Houston, TX

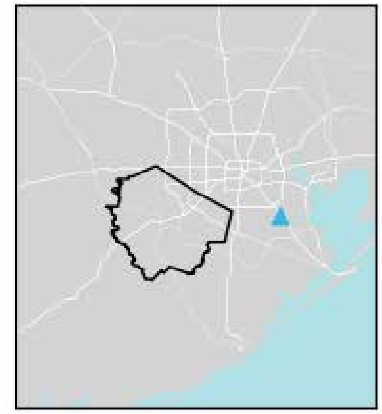


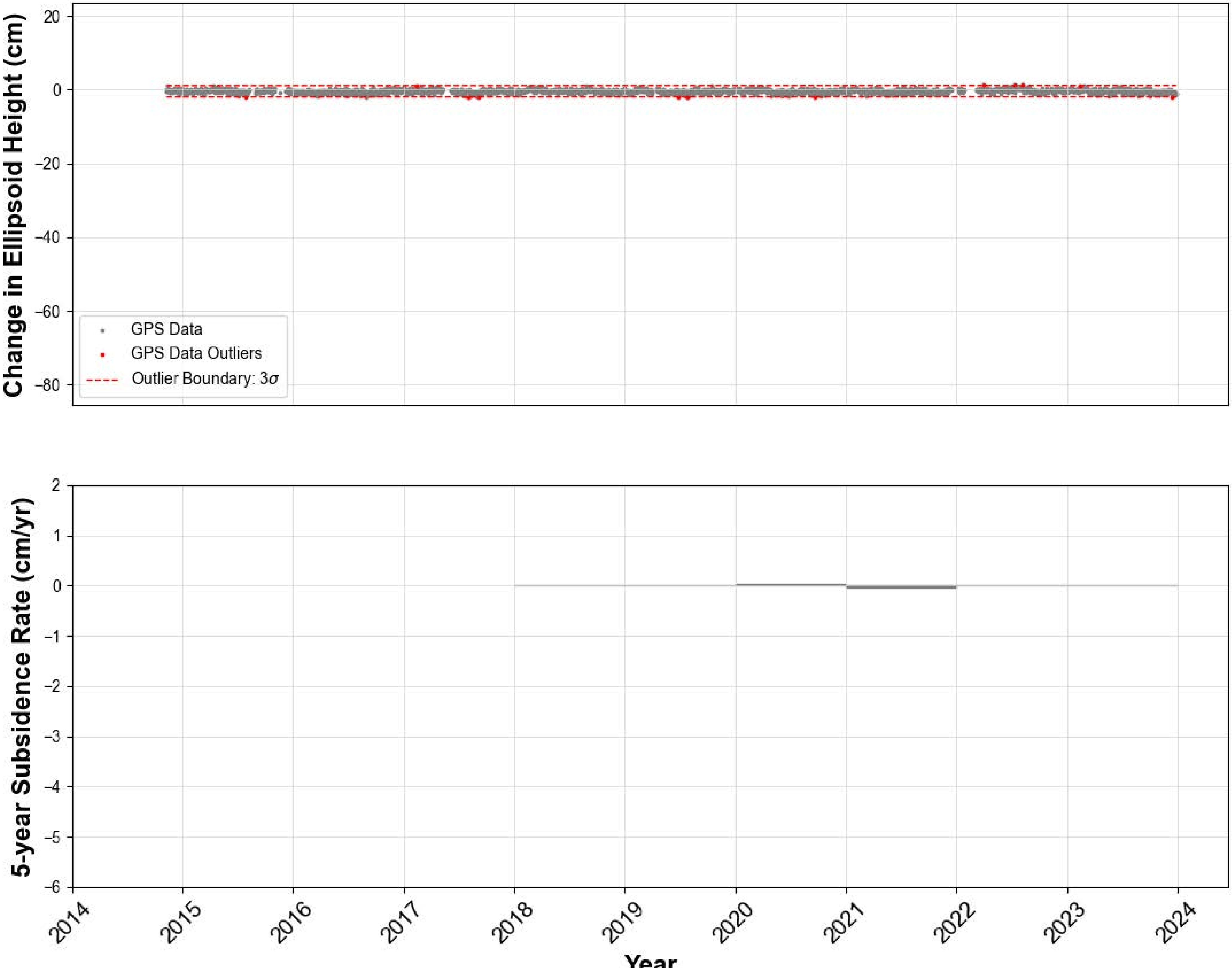


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P081

Houston, TX

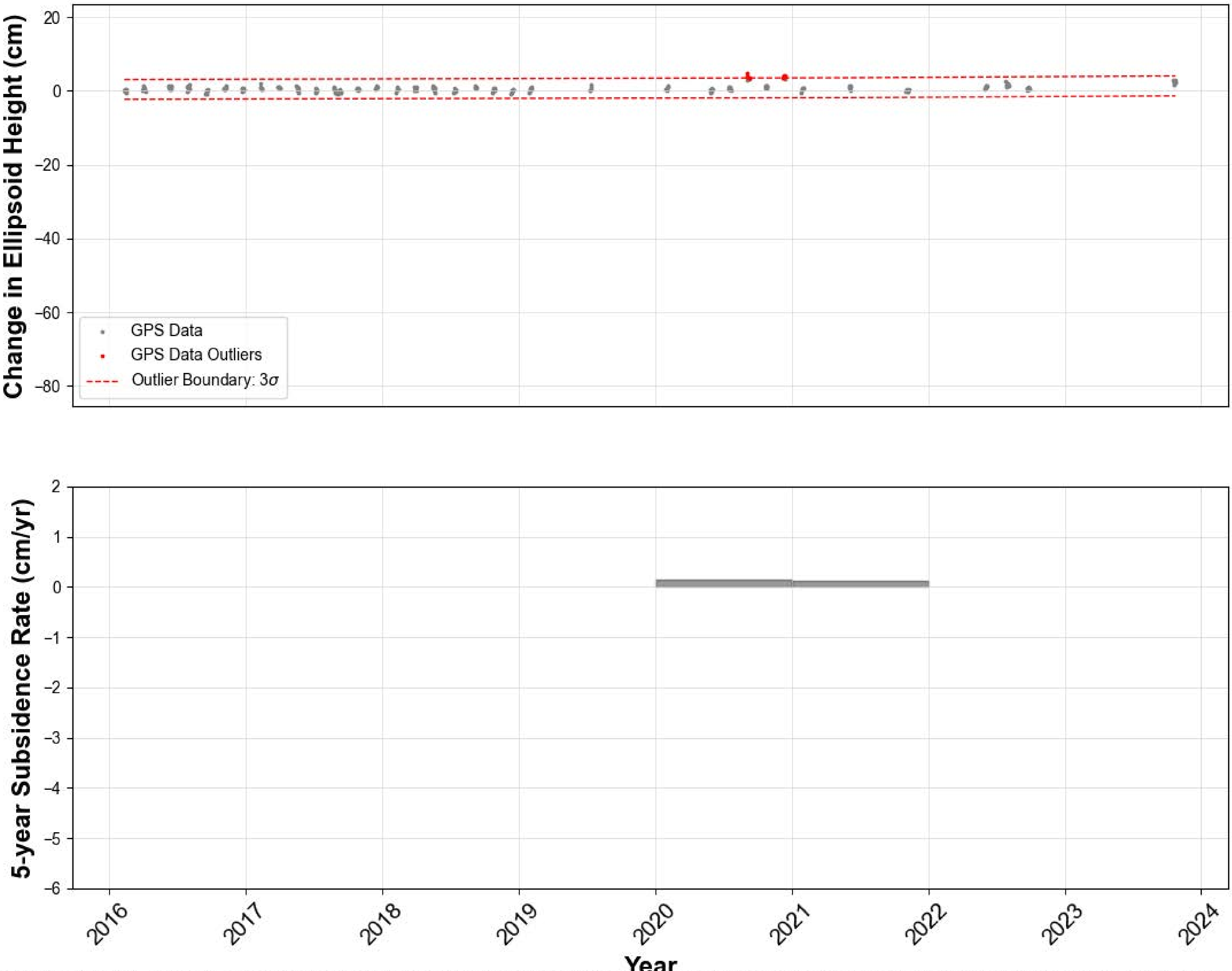




Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P082

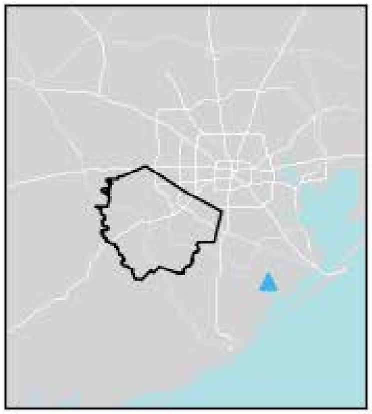
Damon, TX

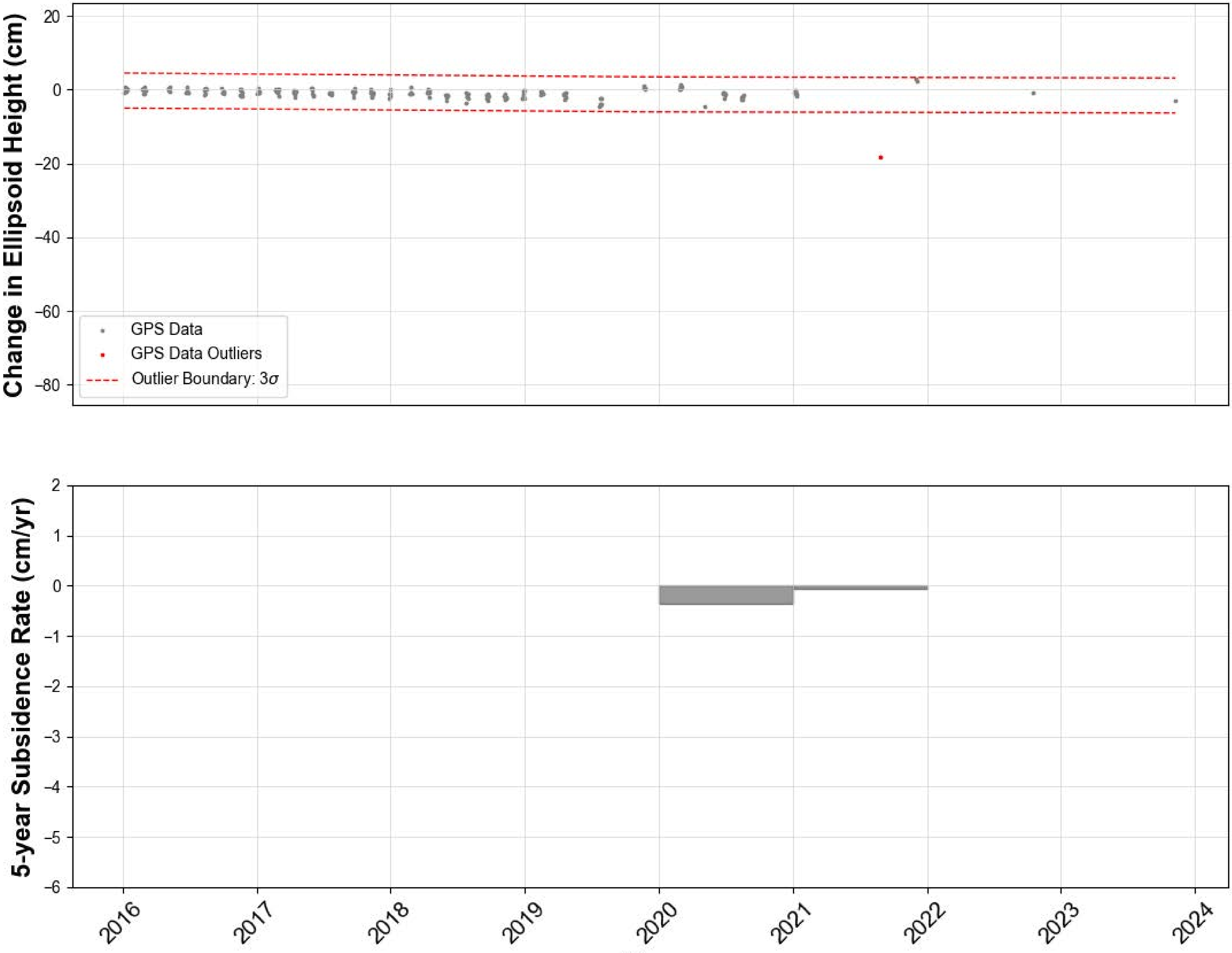


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P083

Alvin, TX

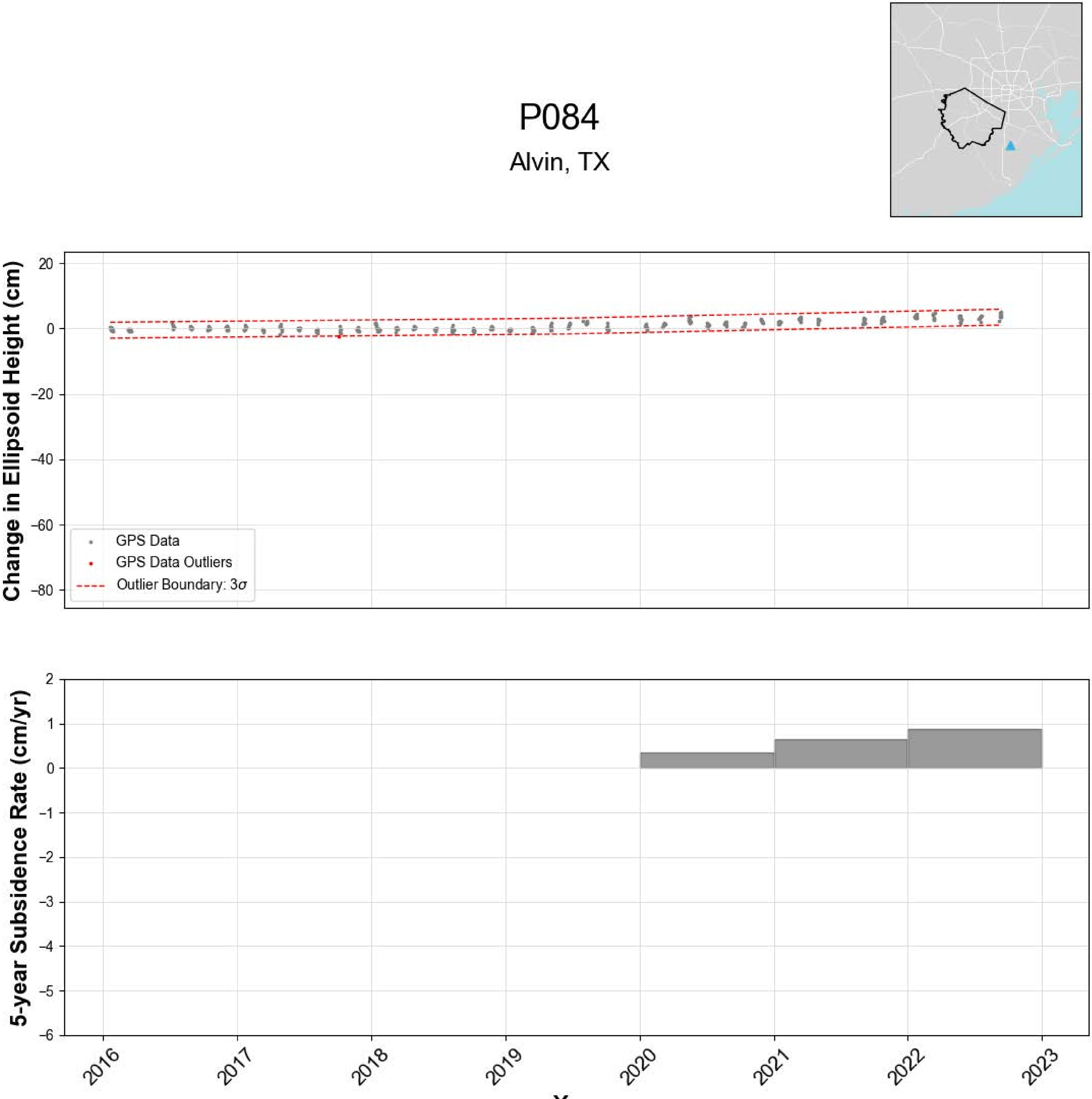




Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P084

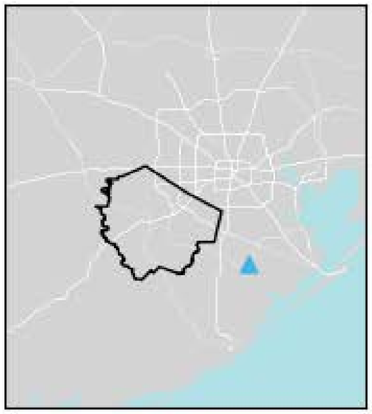
Alvin, TX

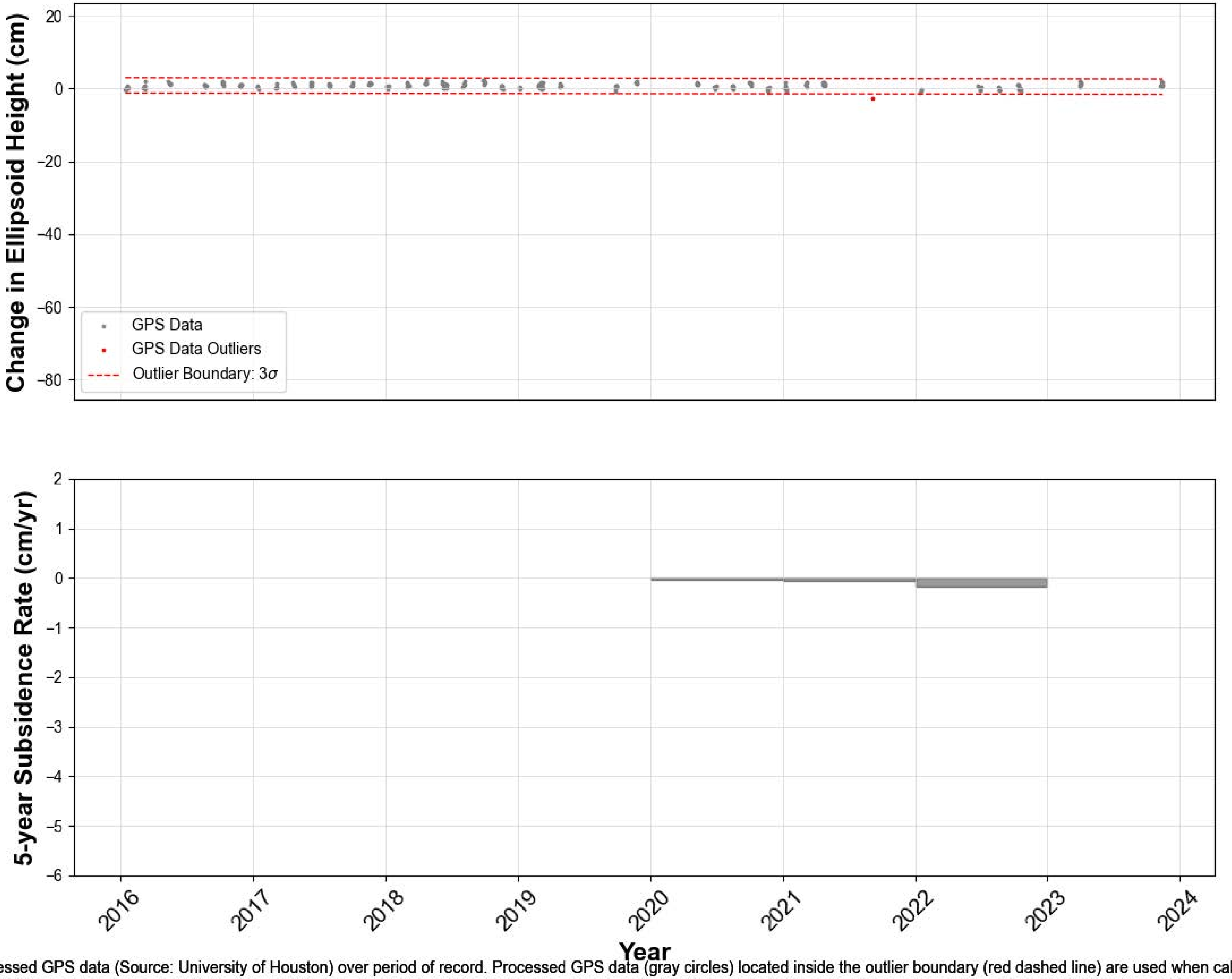


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P085

Alvin, TX

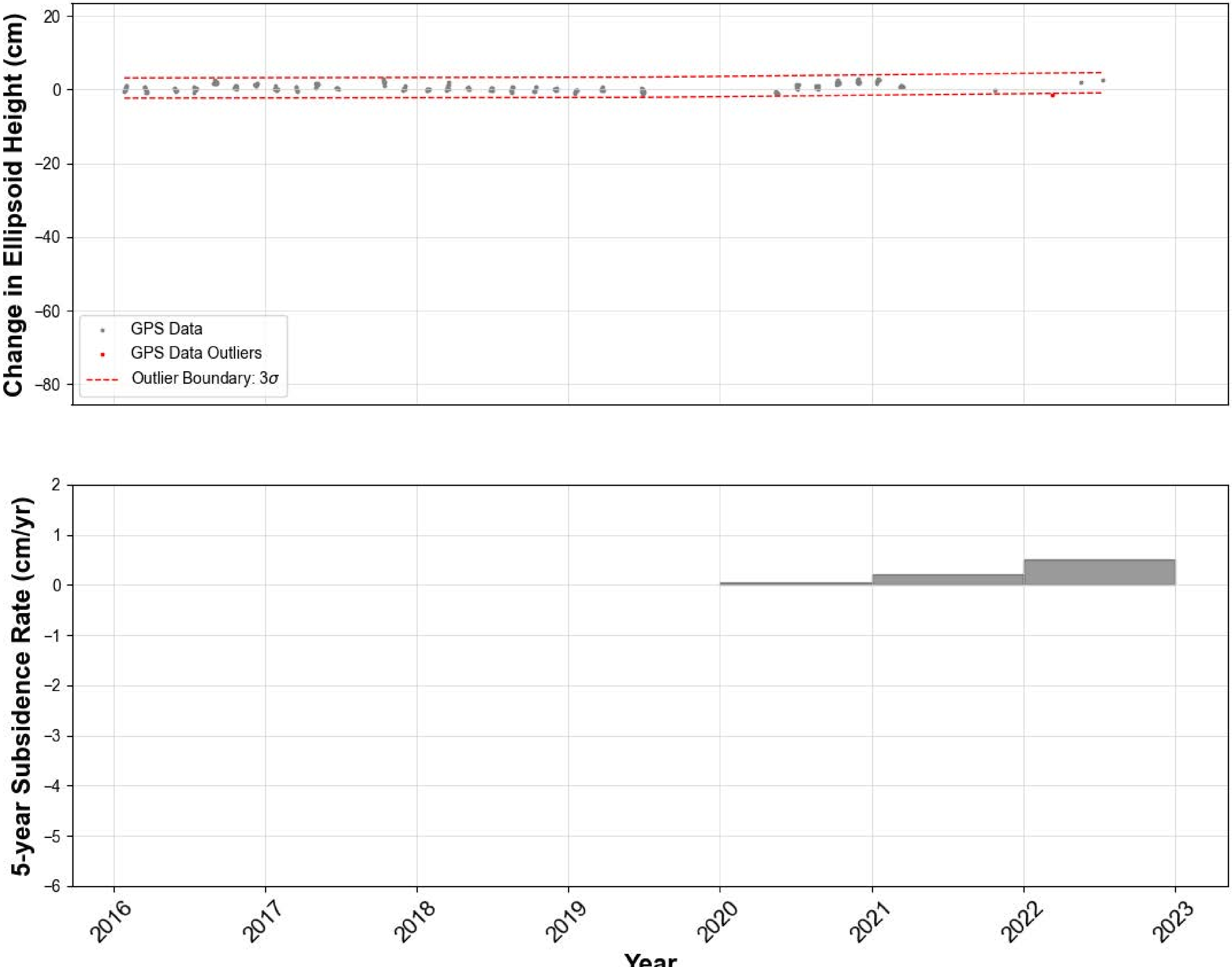




Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P086

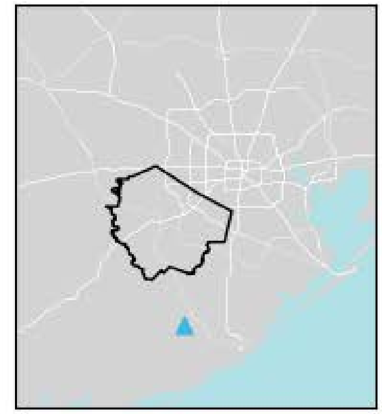
Angleton, TX

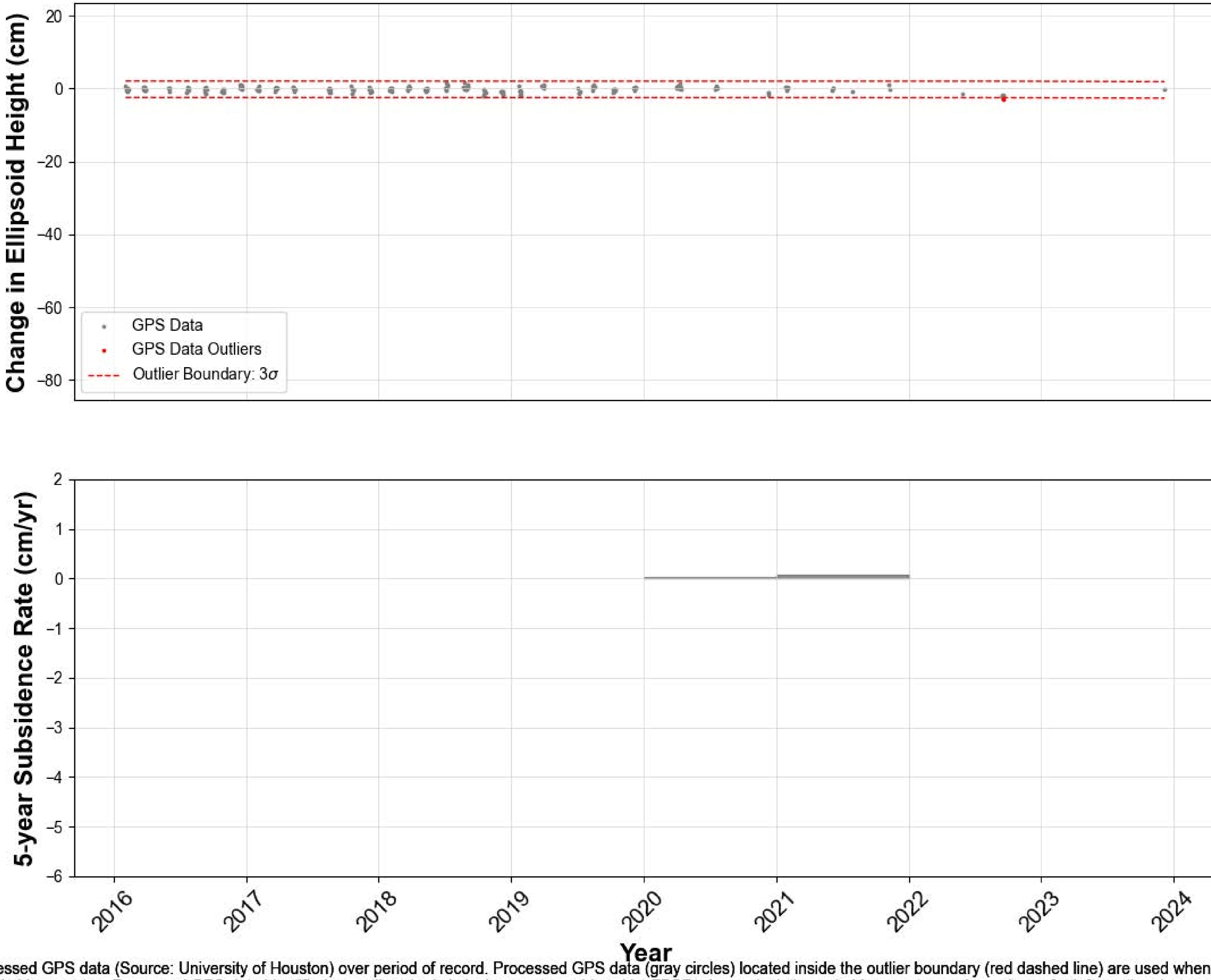


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P087

Sweeny, TX

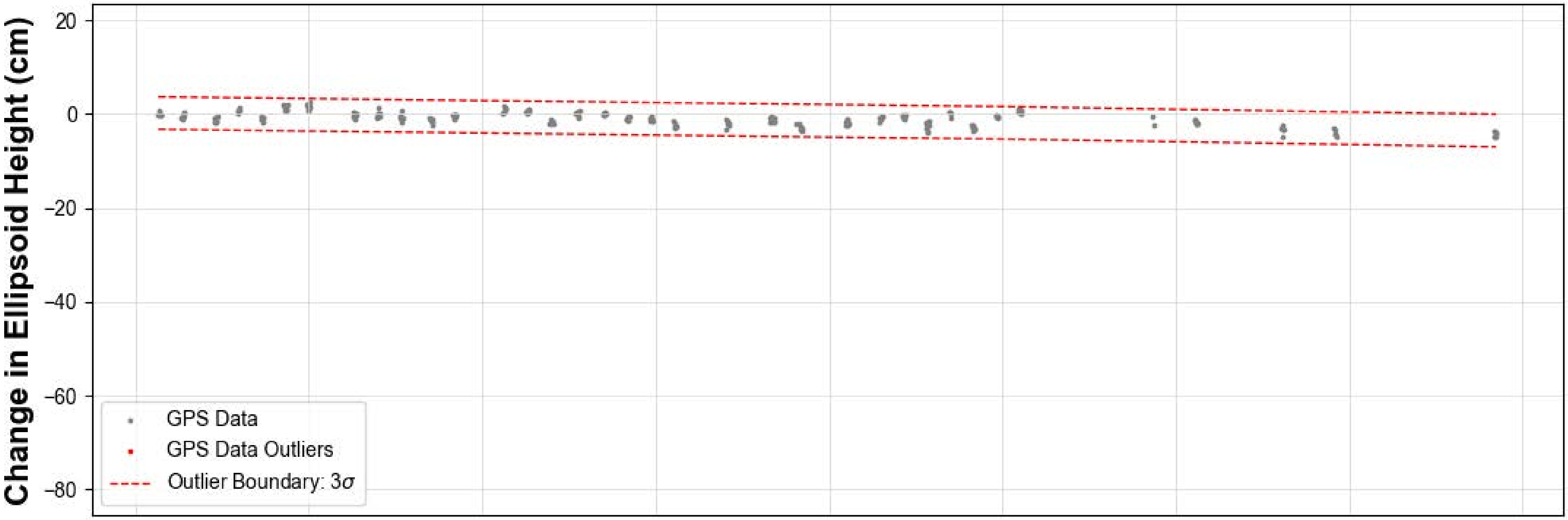


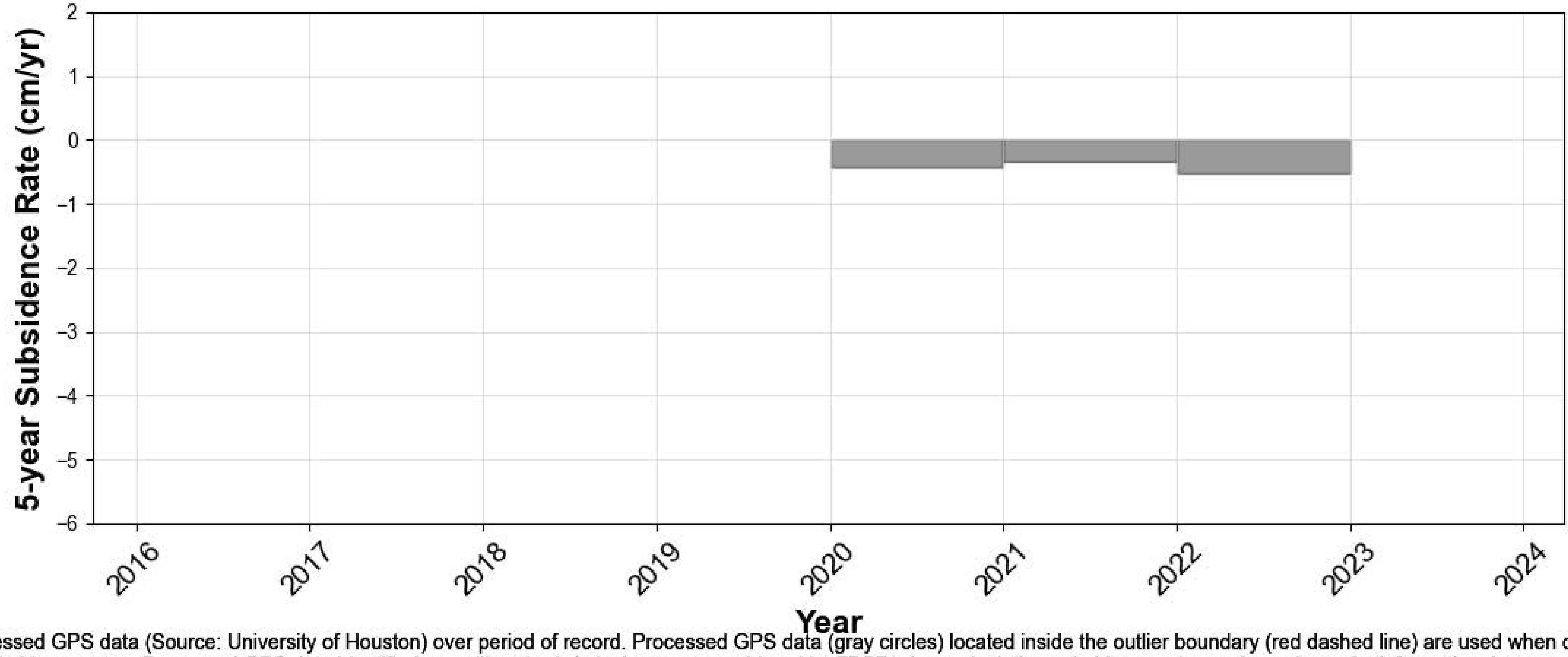


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P088

Rosharon, TX

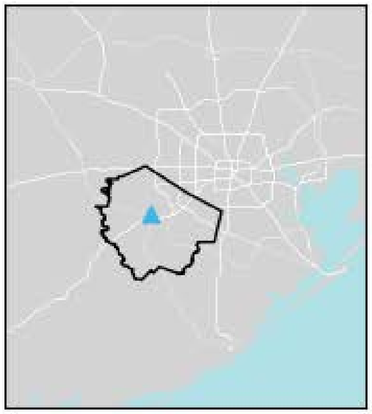


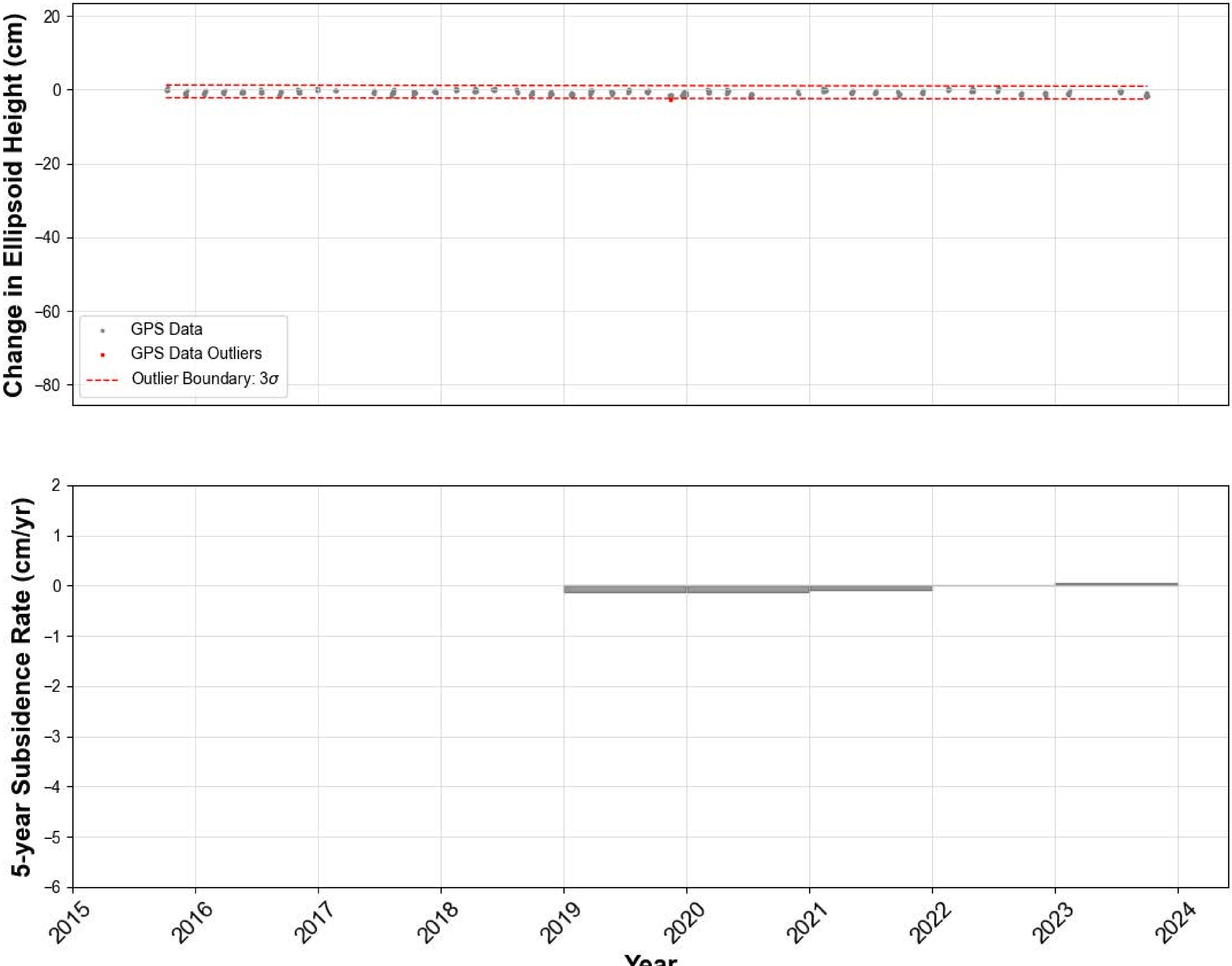


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P089

Rosenberg, TX

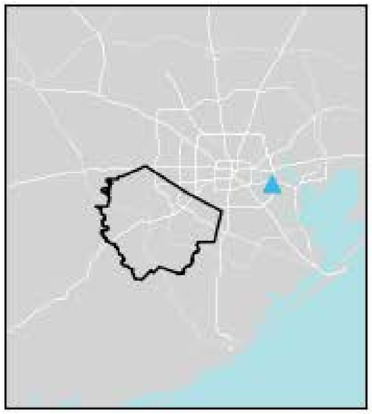


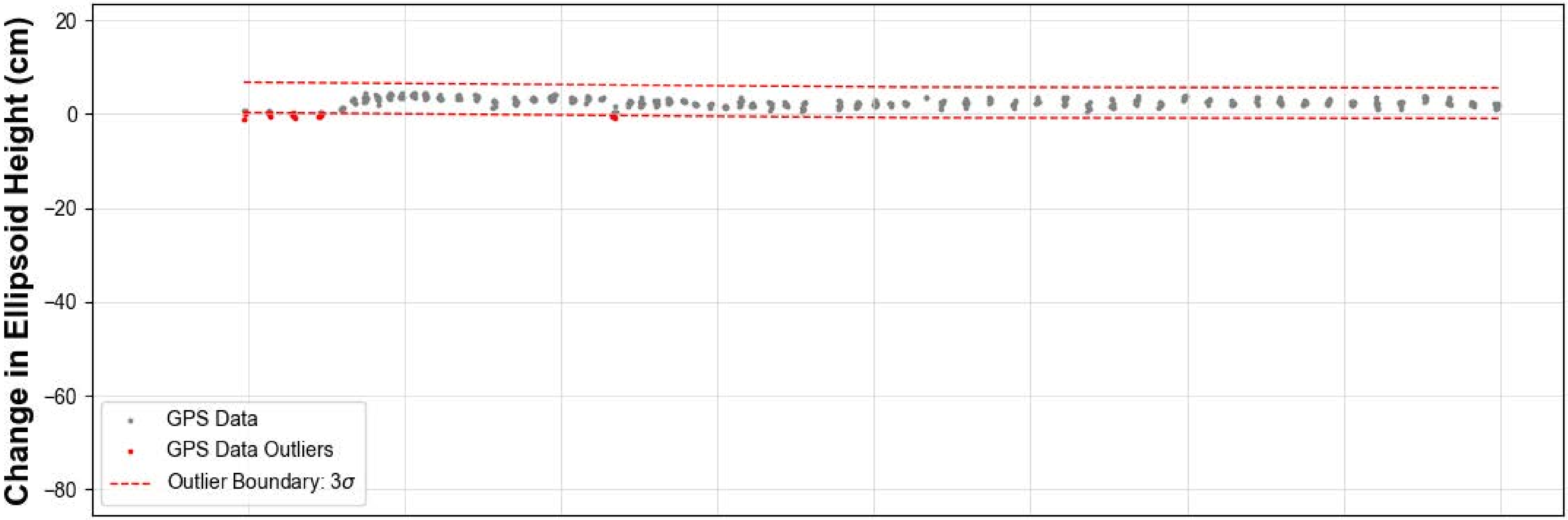


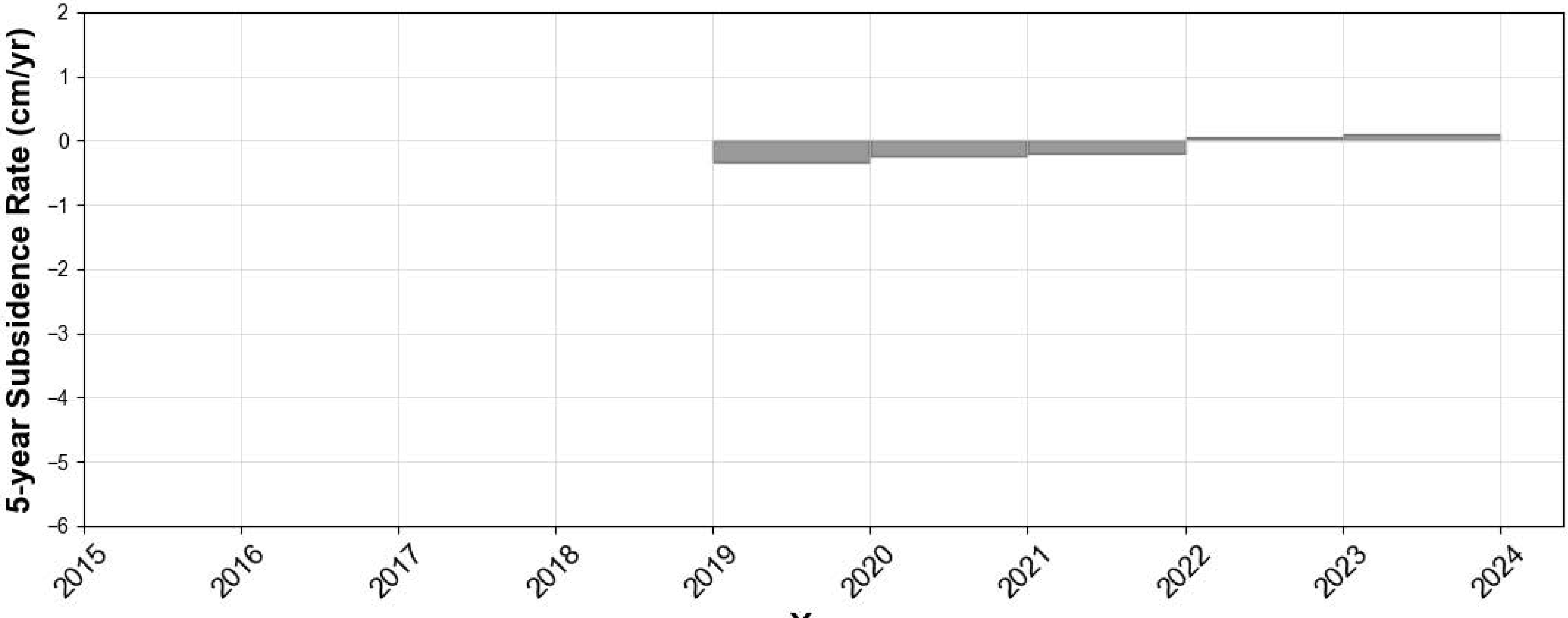
Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P090

Pasadena, TX



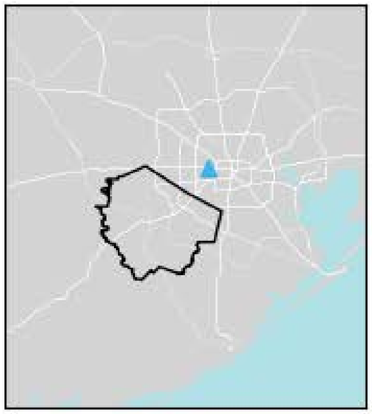


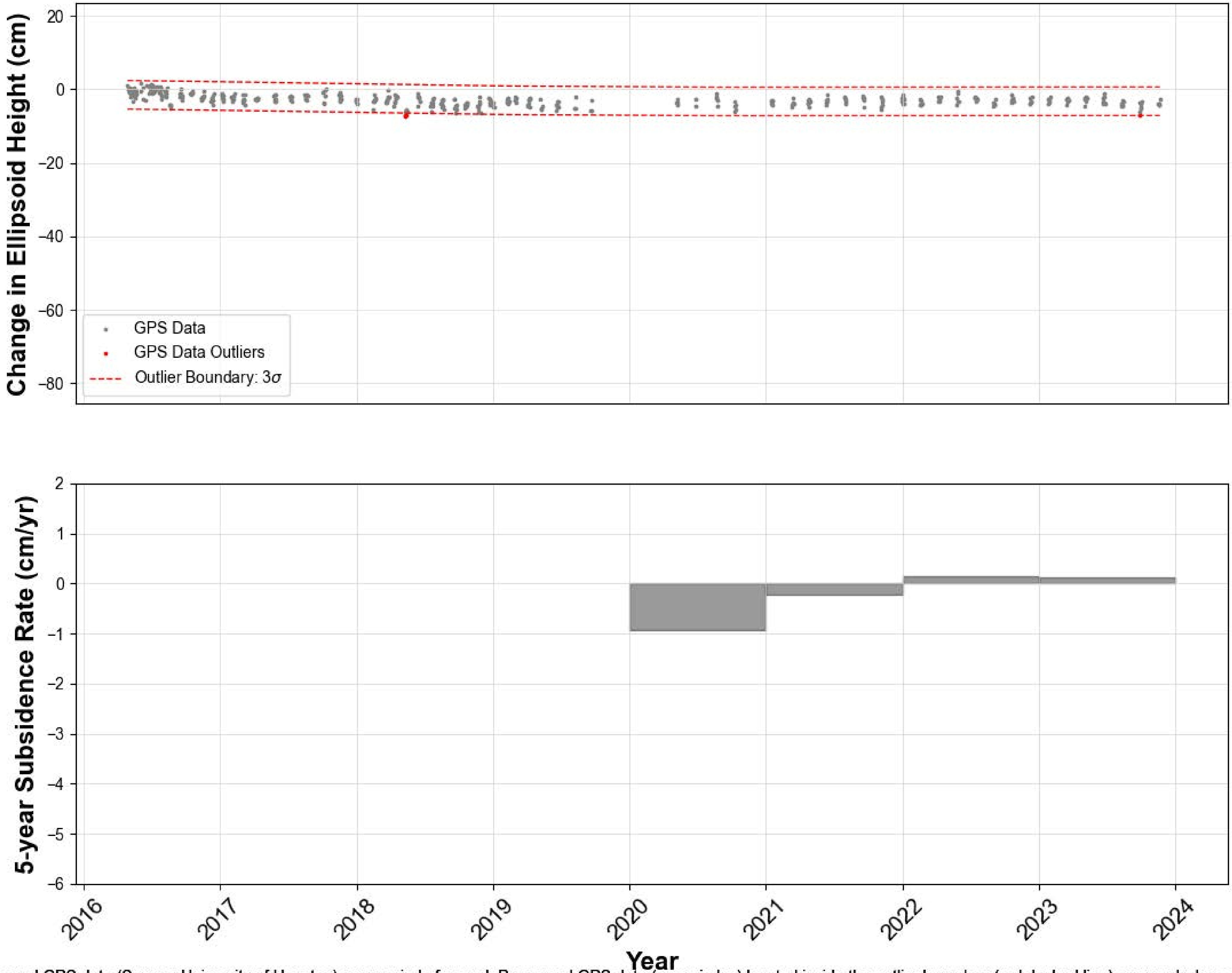


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P091

Houston, TX

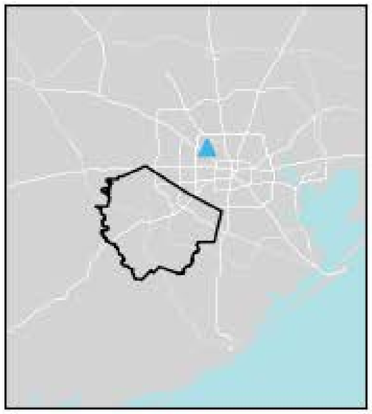


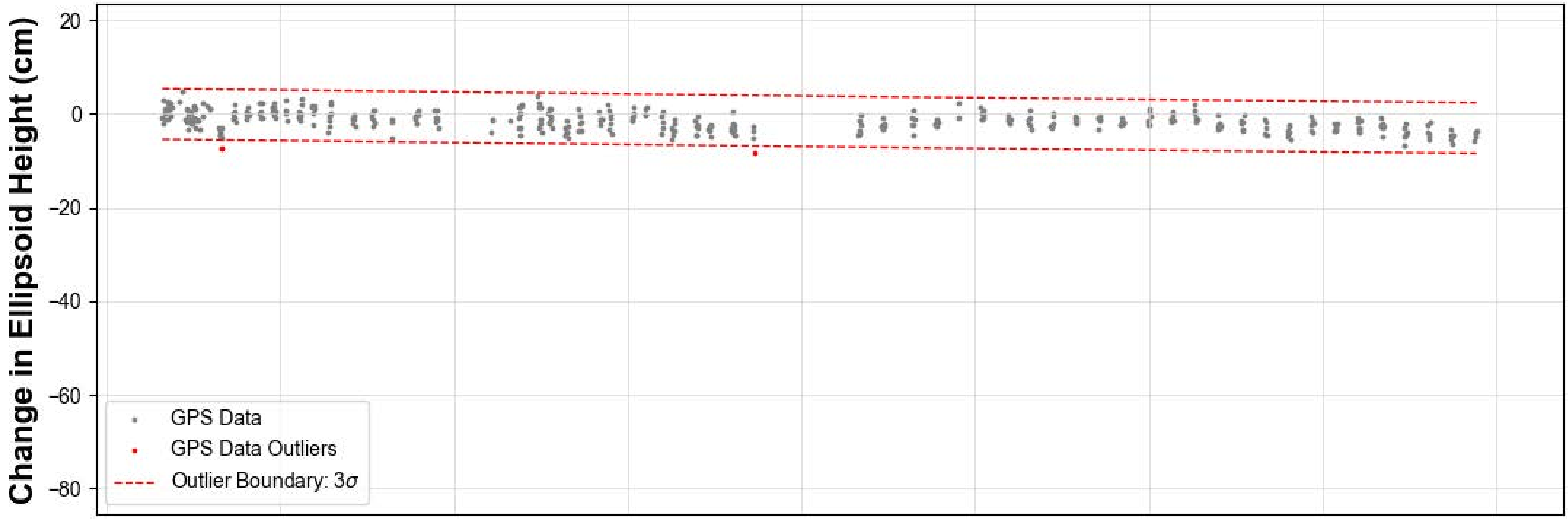


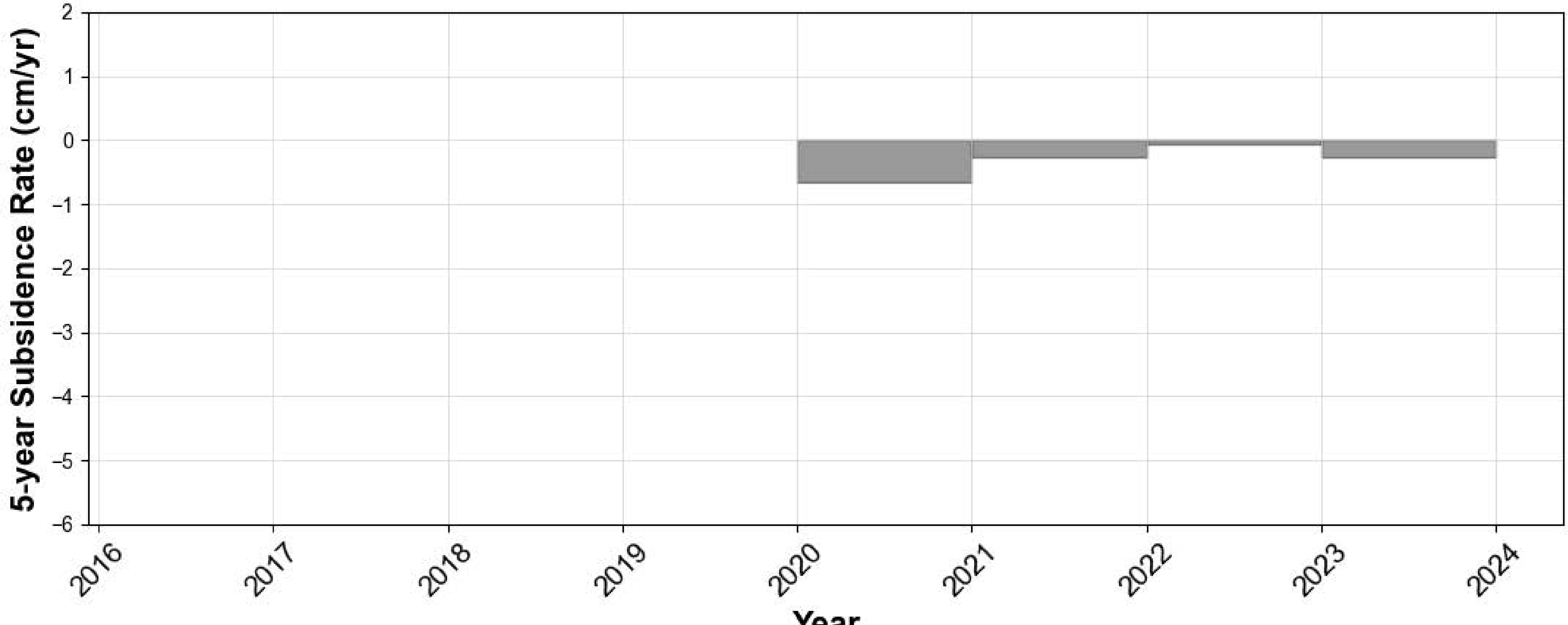
Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P092

Houston, TX



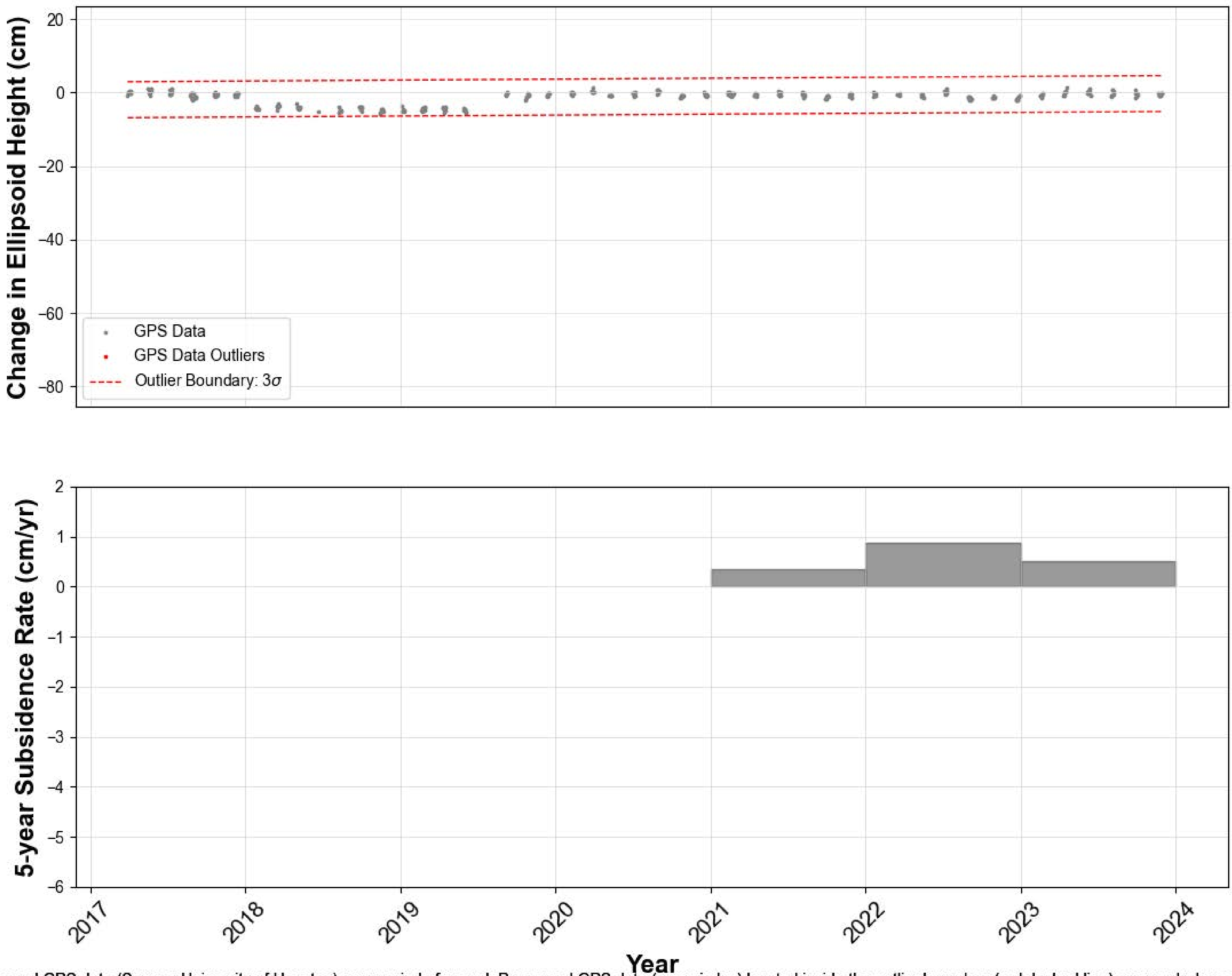




Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P093

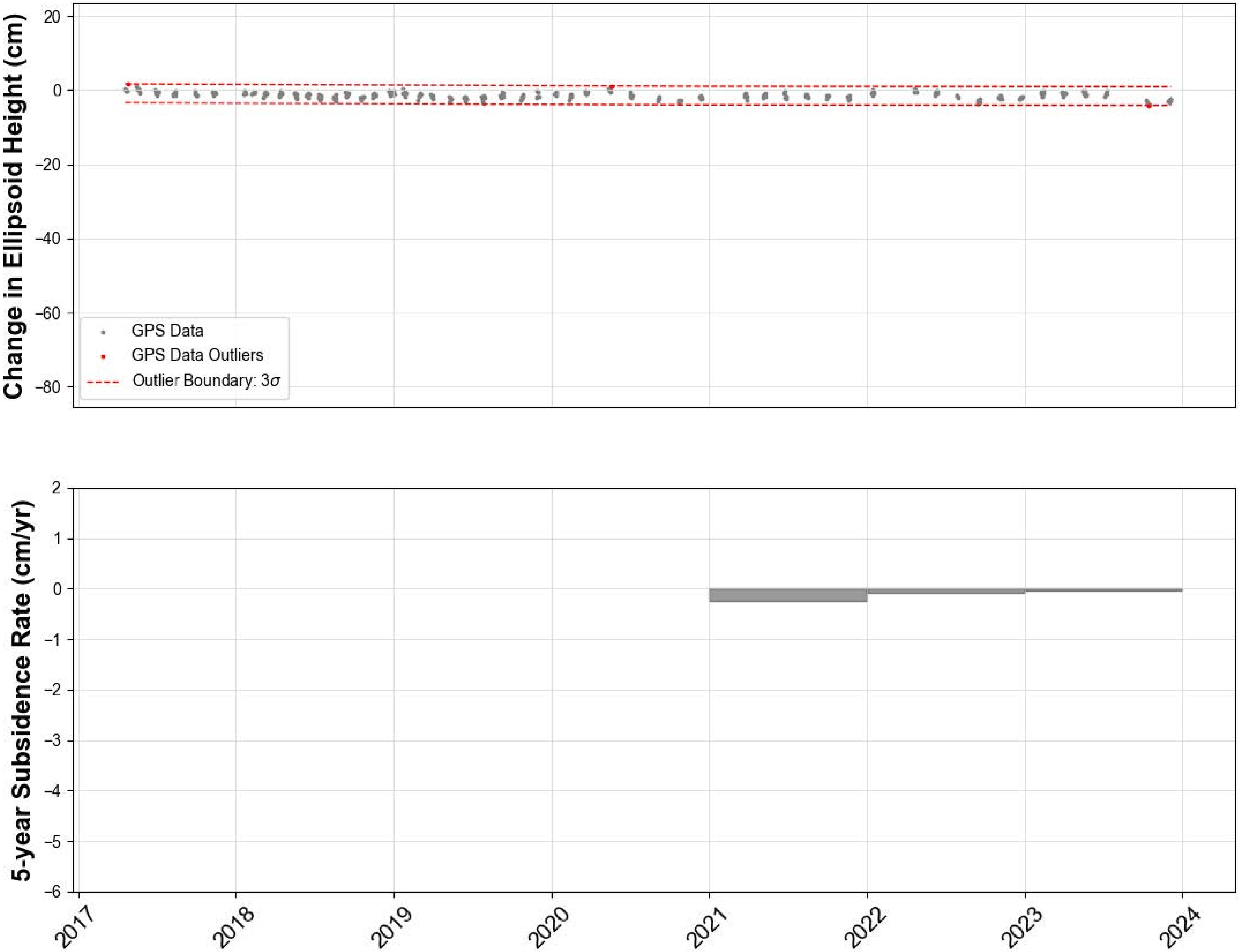
Alvin, TX



Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P094

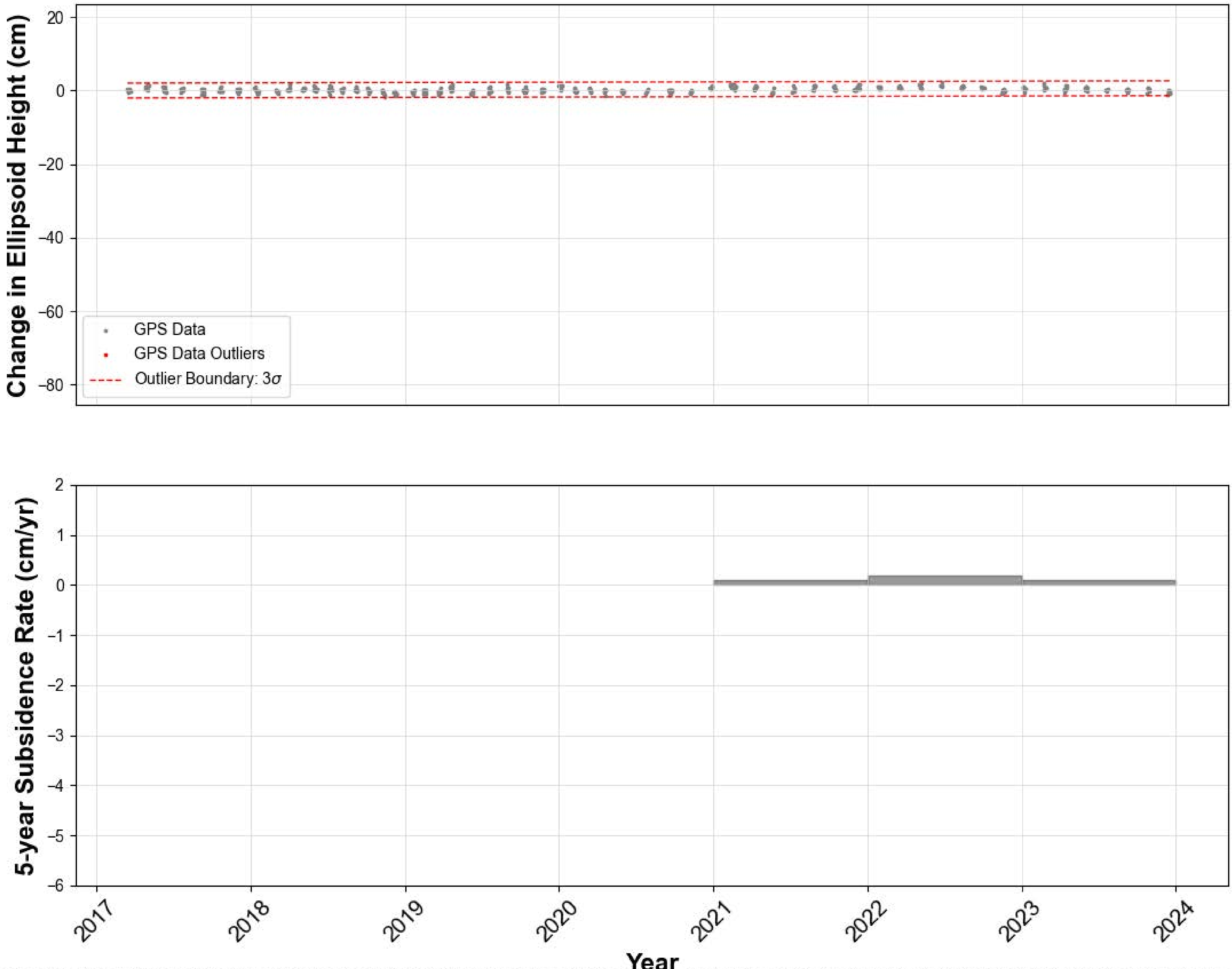
Houston, TX



Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P095

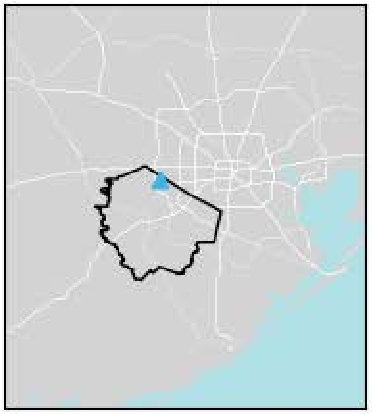
Houston, TX

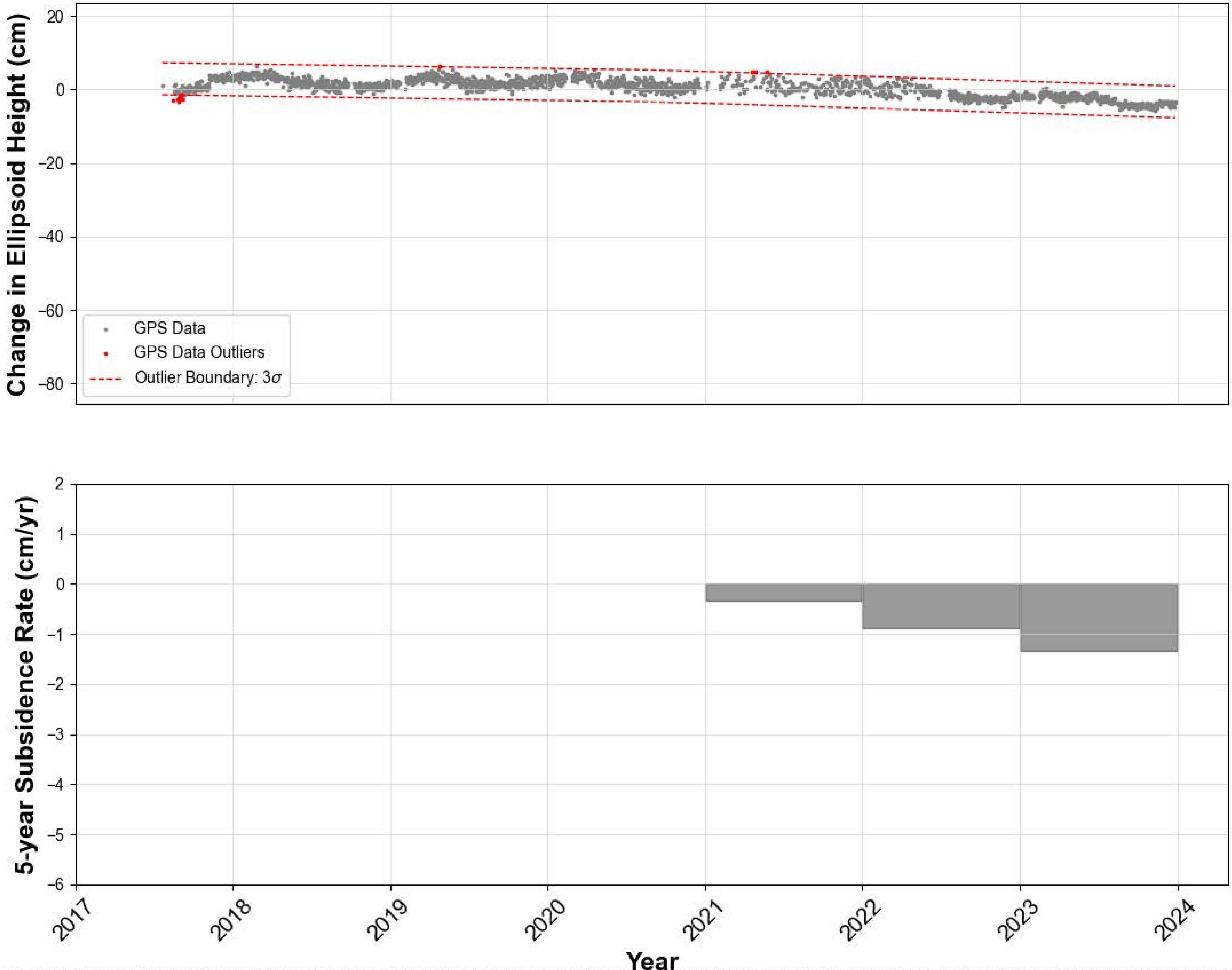


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P096

Katy, TX

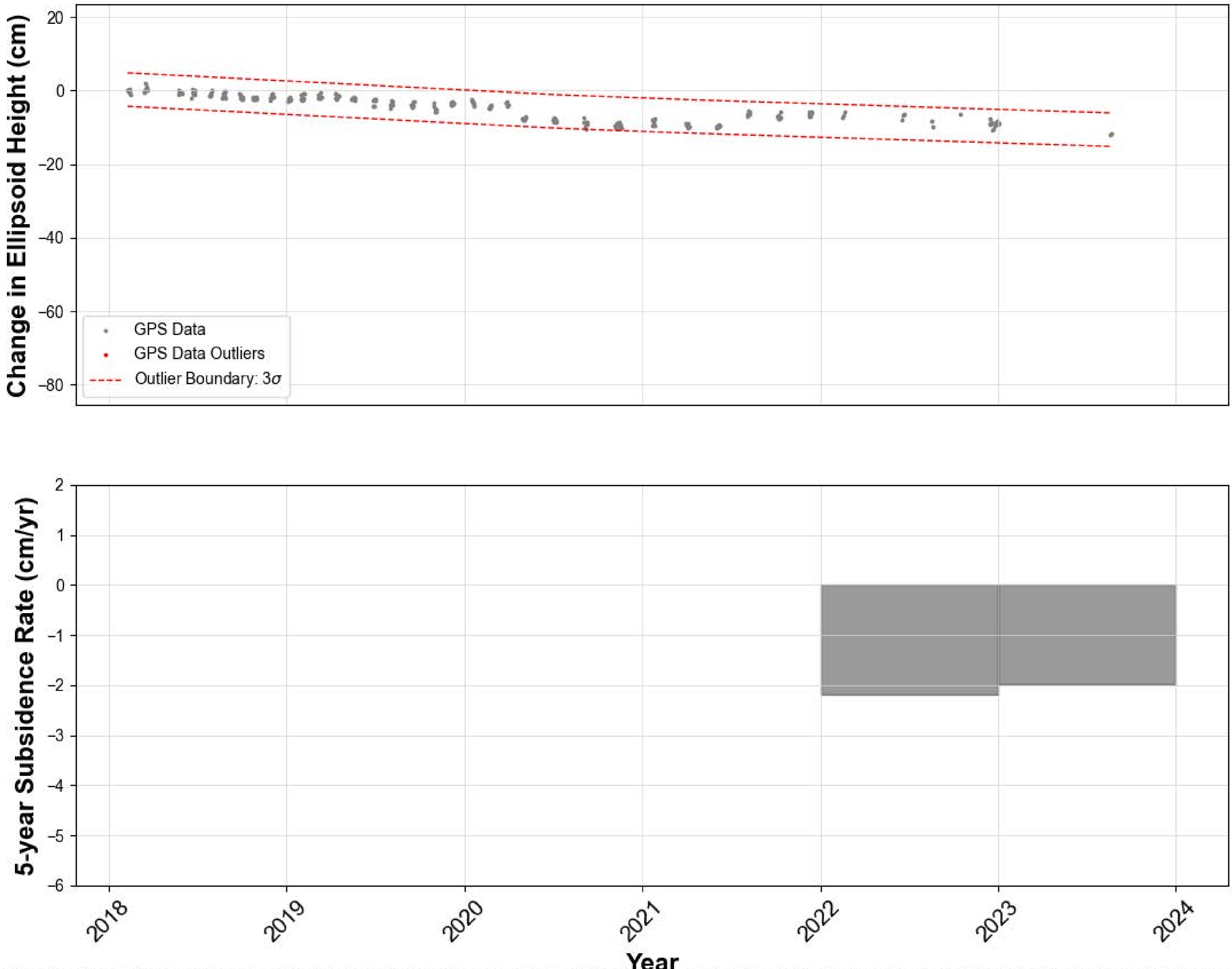




Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P097

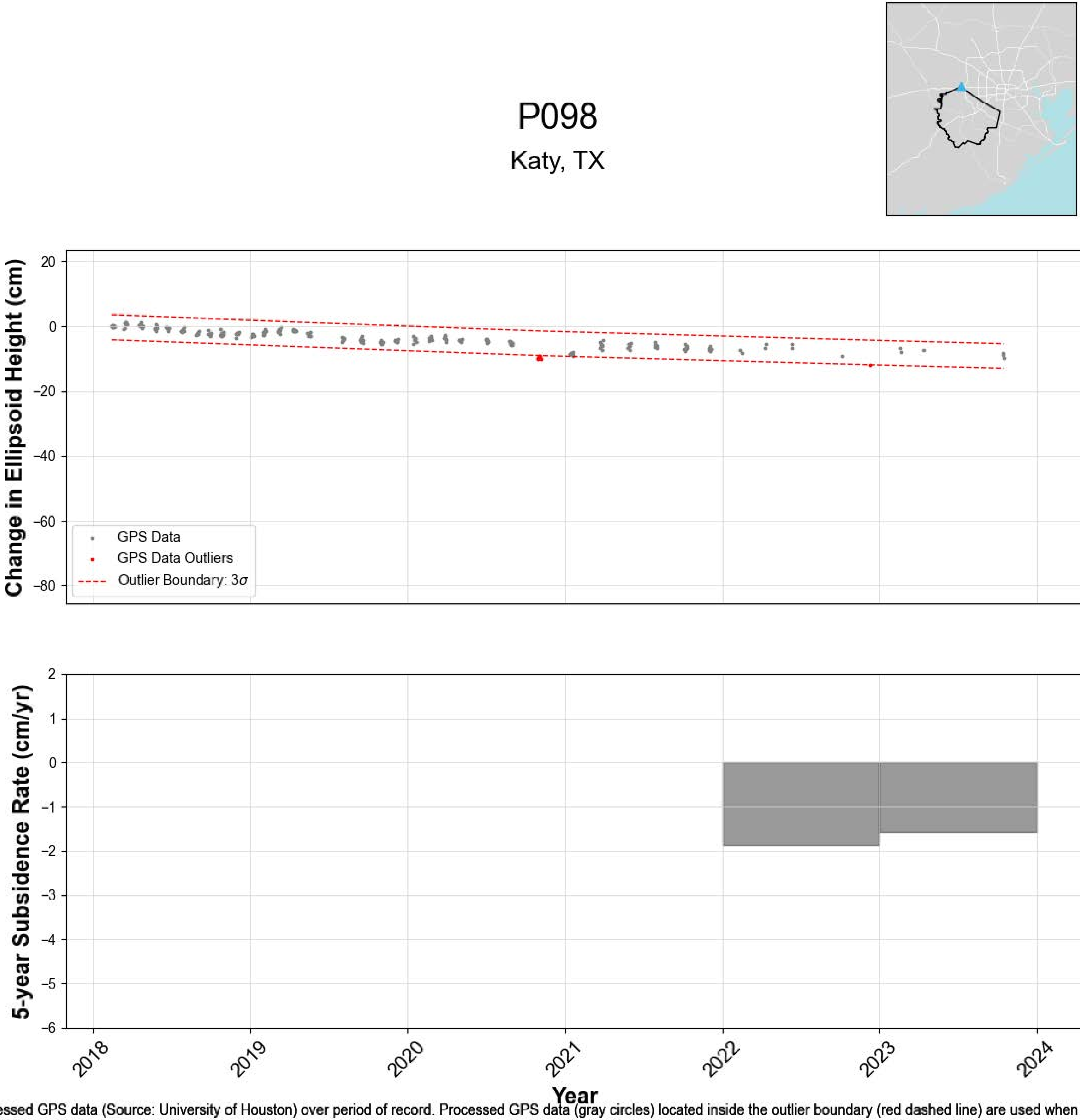
Katy, TX



Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P098

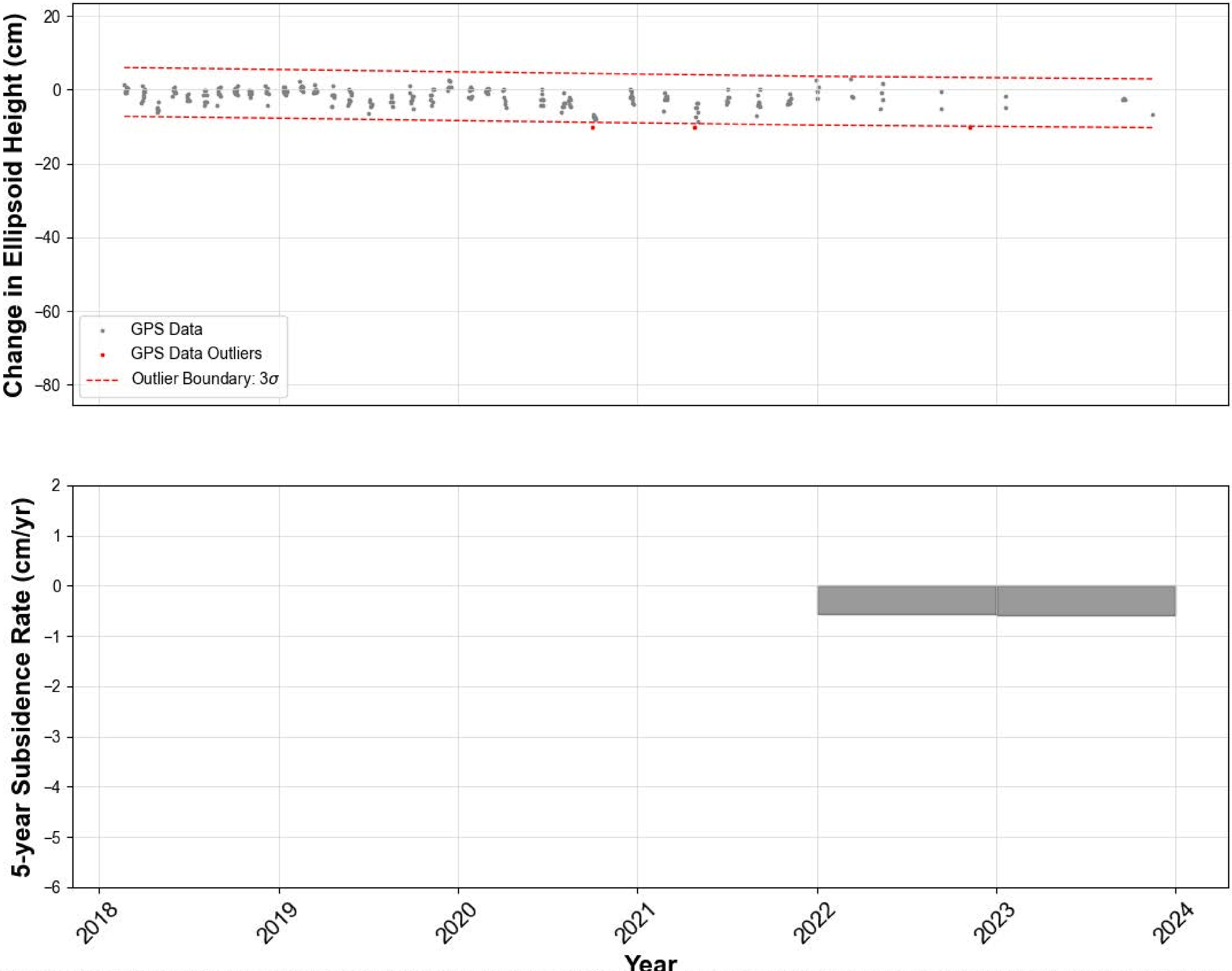
Katy, TX



Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P099

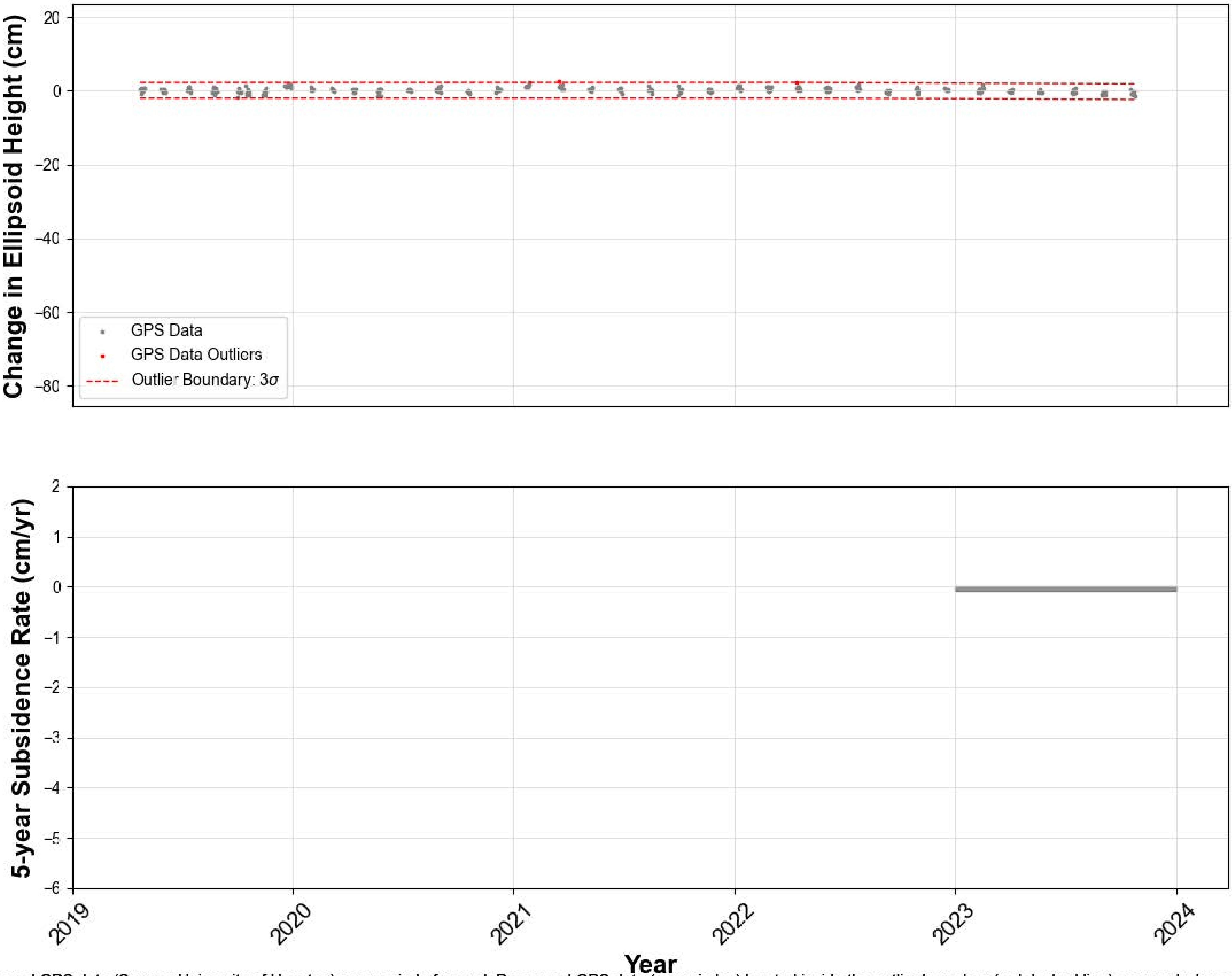
Houston, TX



Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P100

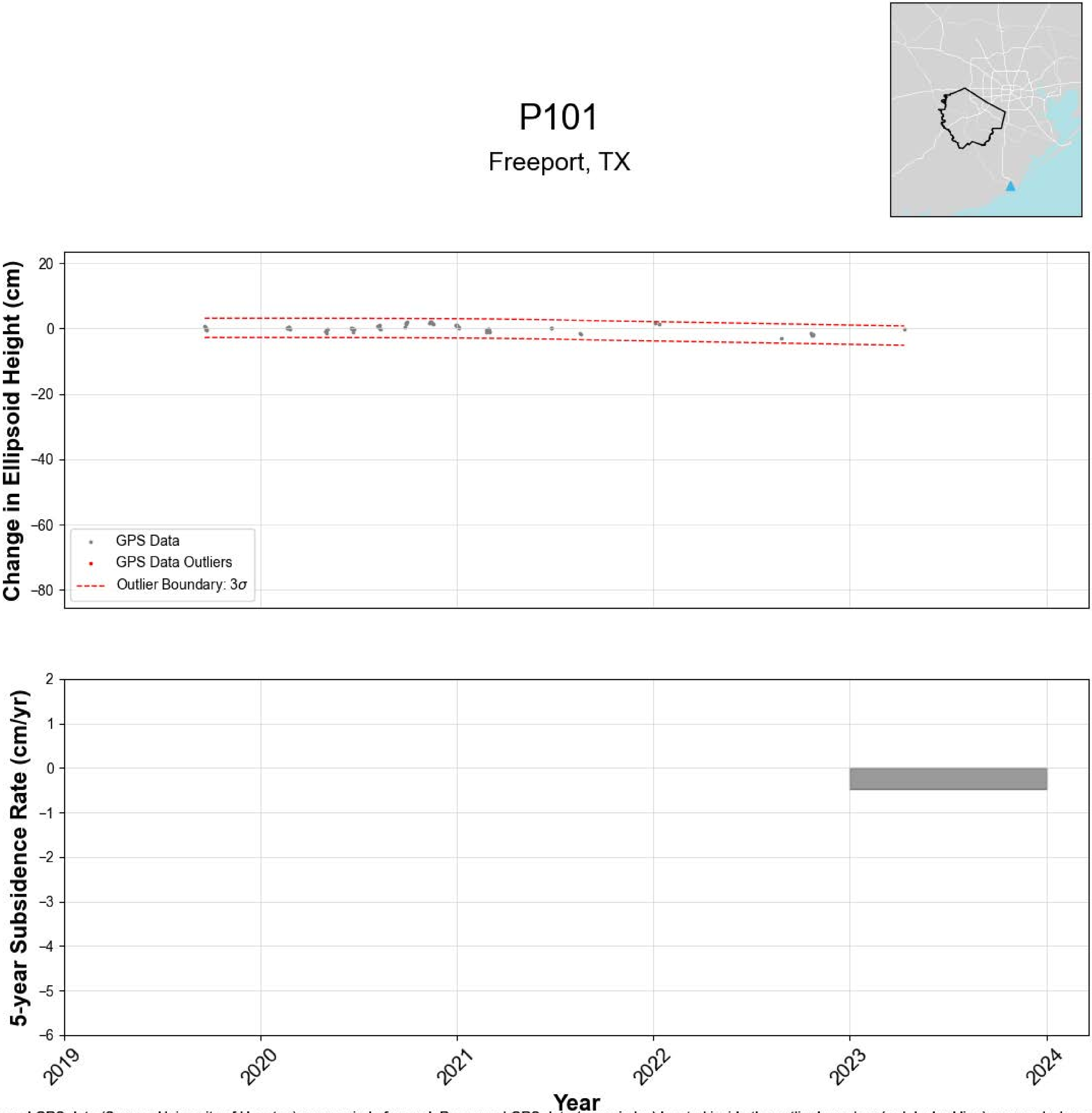
Atascocita, TX



Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P101

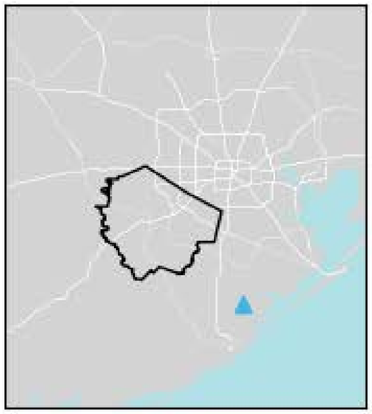
Freeport, TX

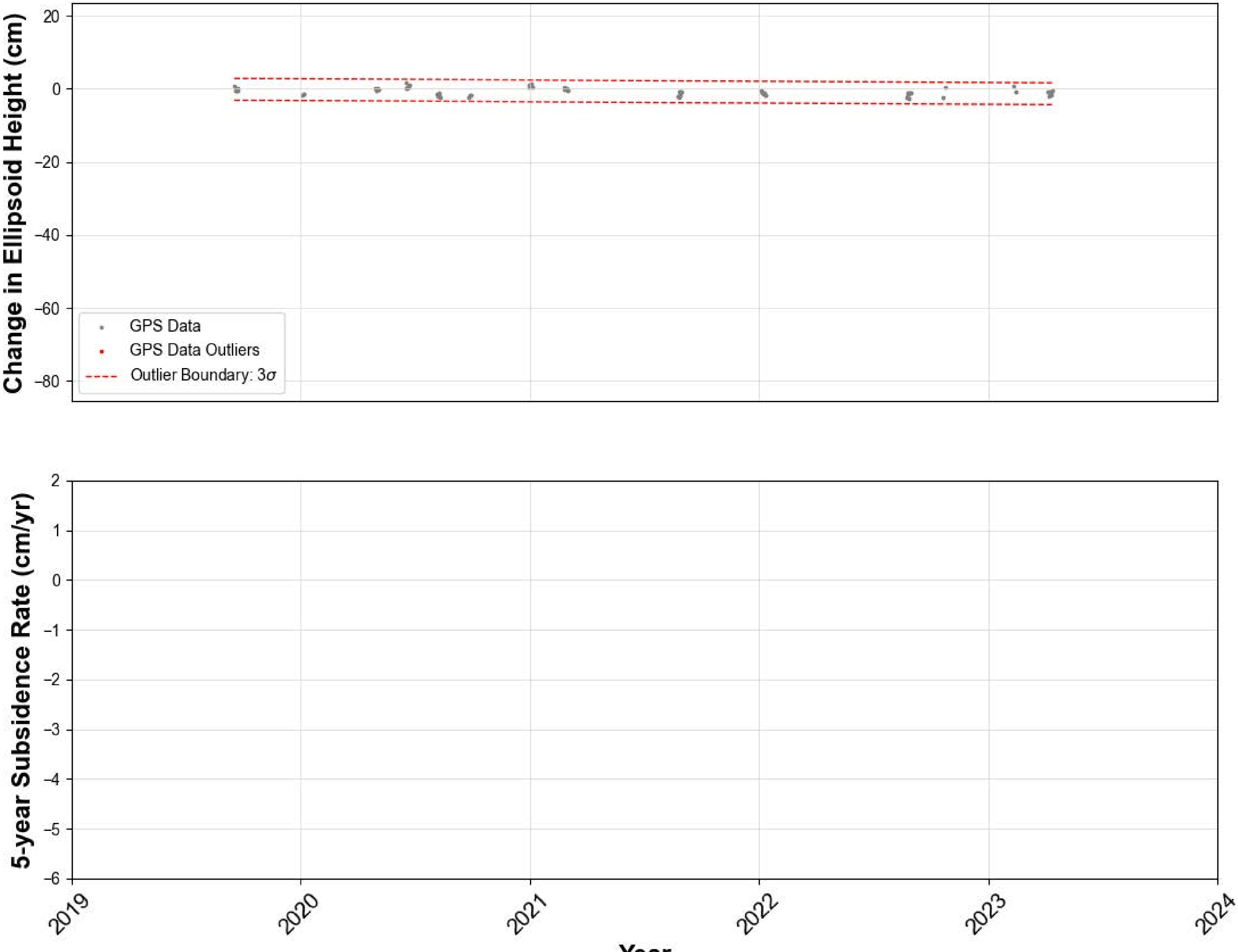


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P103

Angleton, TX

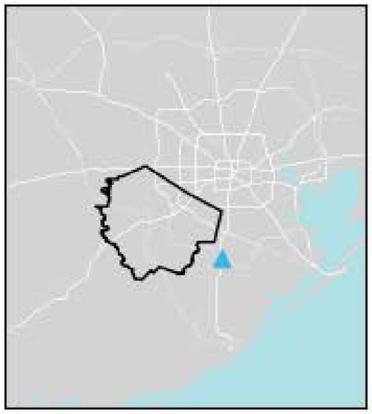


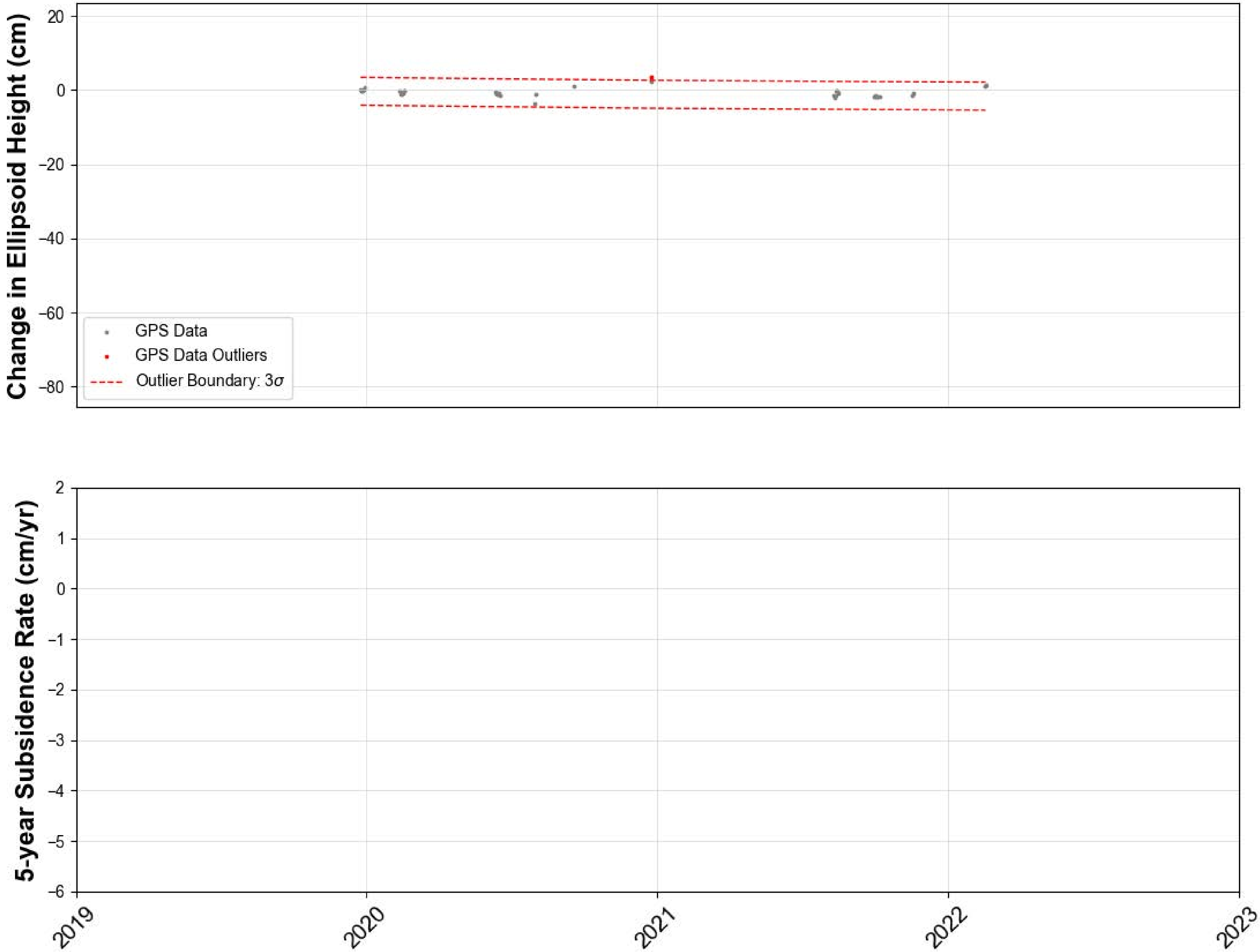


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P104

Rosharon, TX

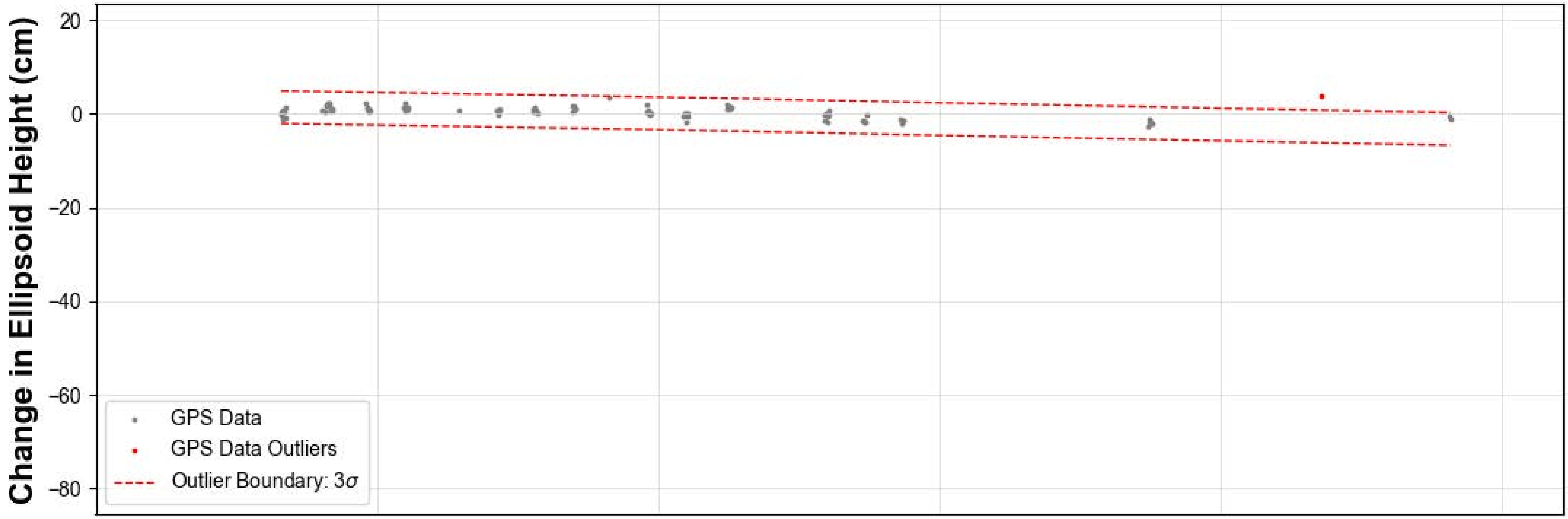


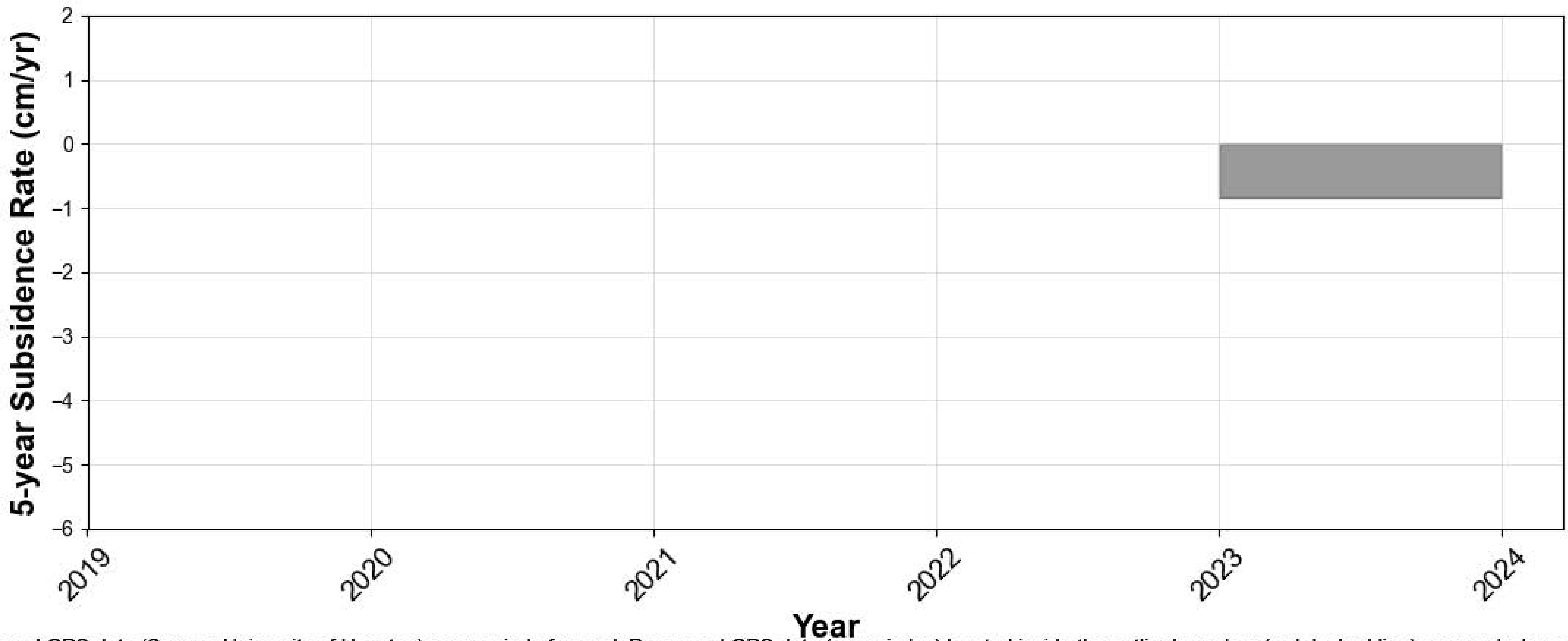


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P105

Manvel, TX

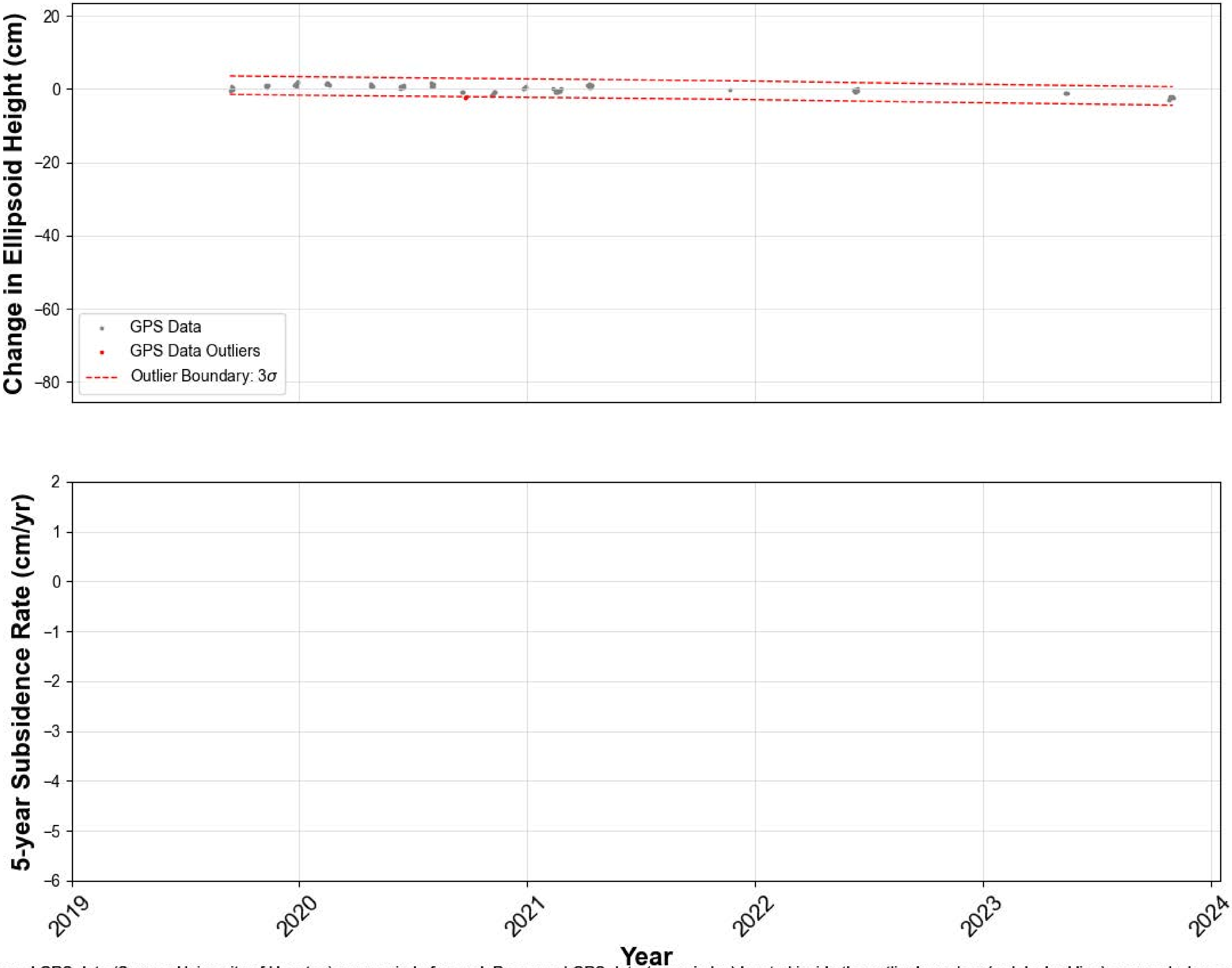




Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P106

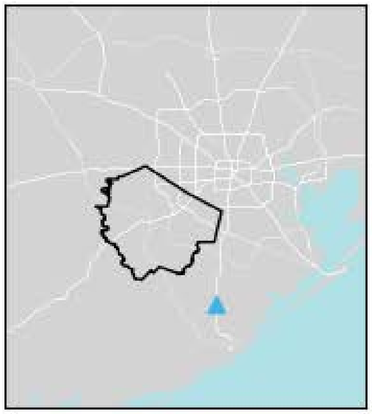
Pearland, TX

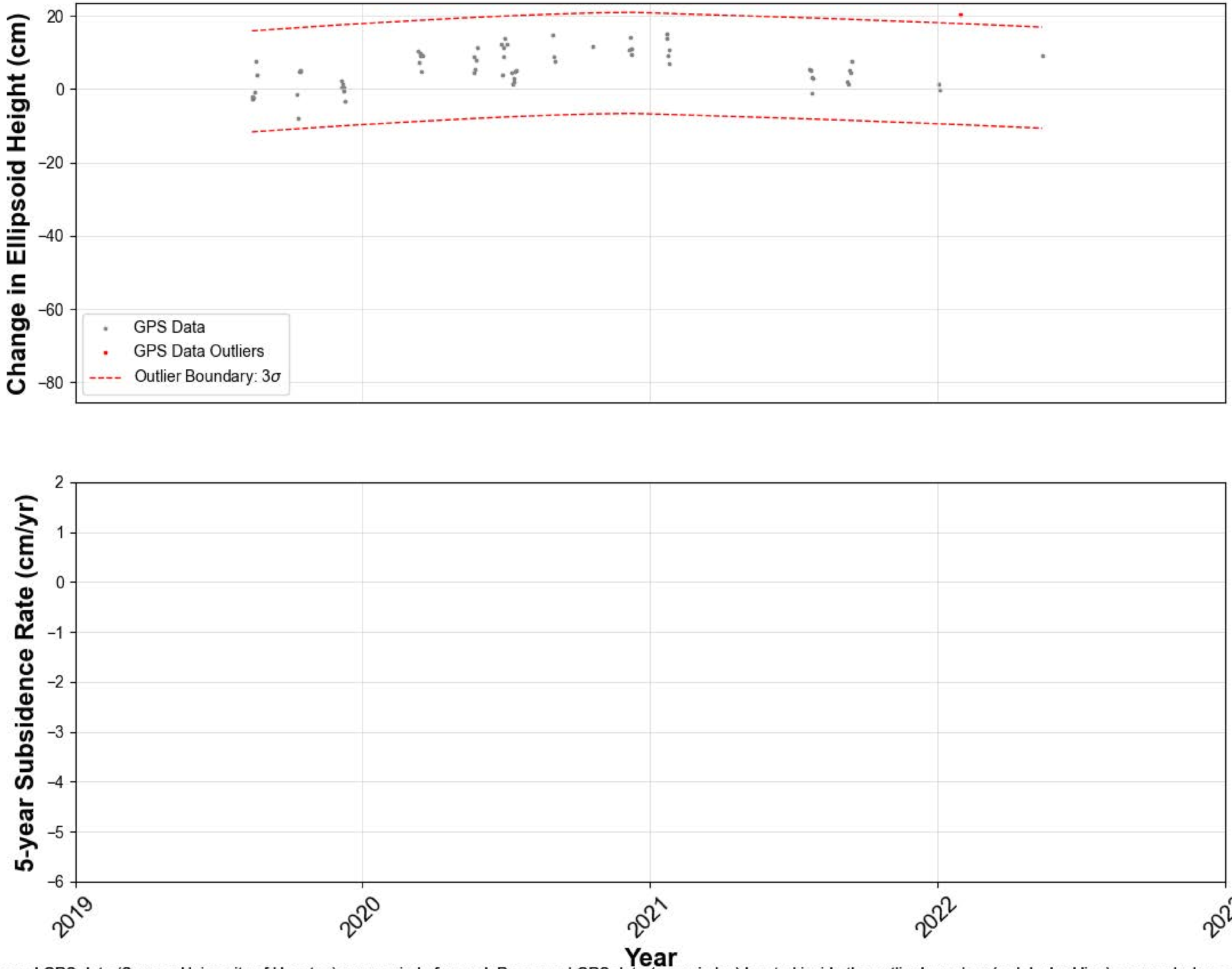


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P107

Angleton, TX

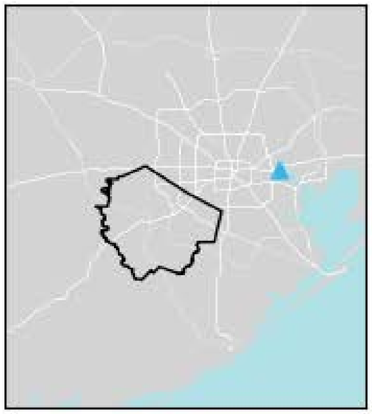


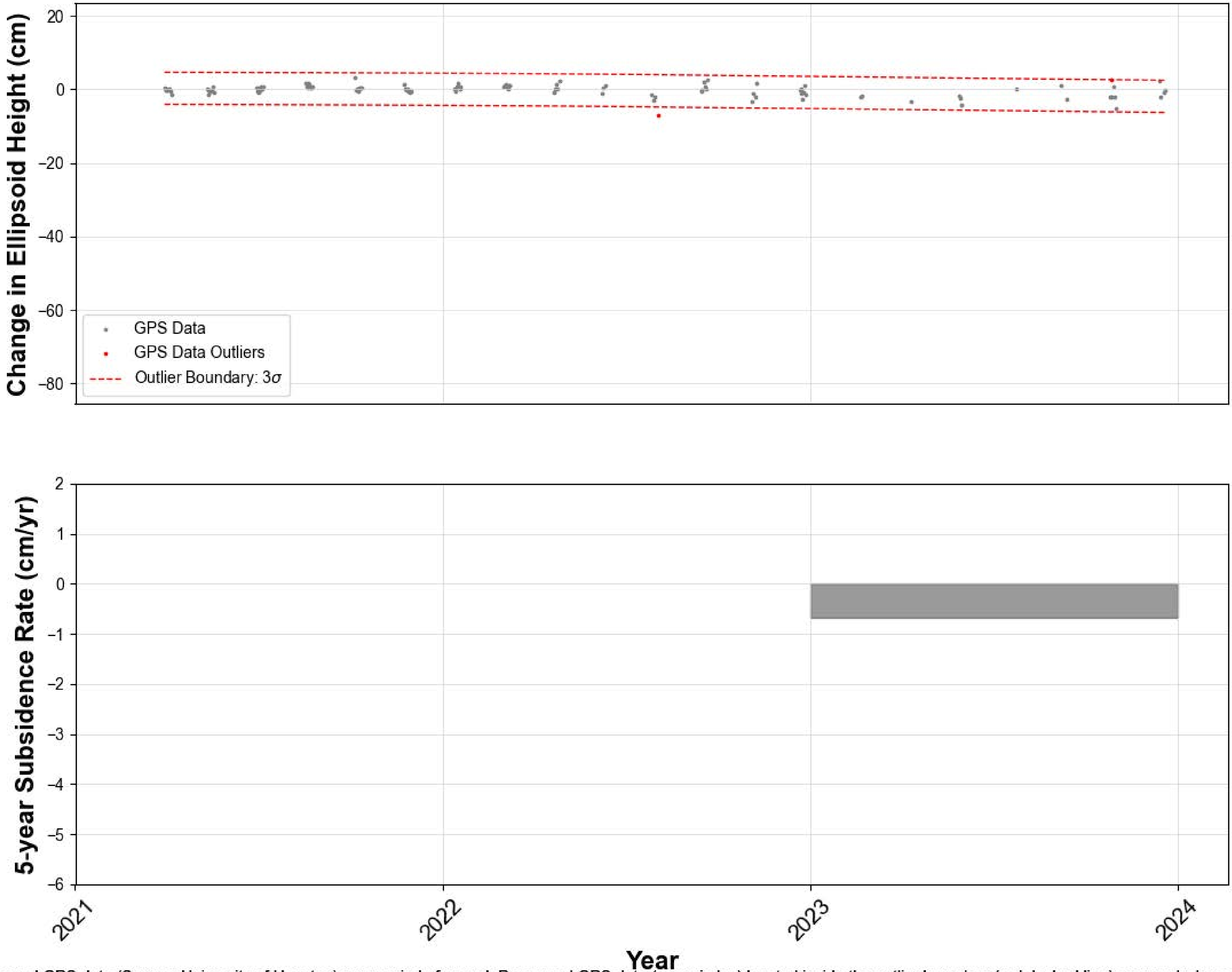


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P108

Channelview, TX

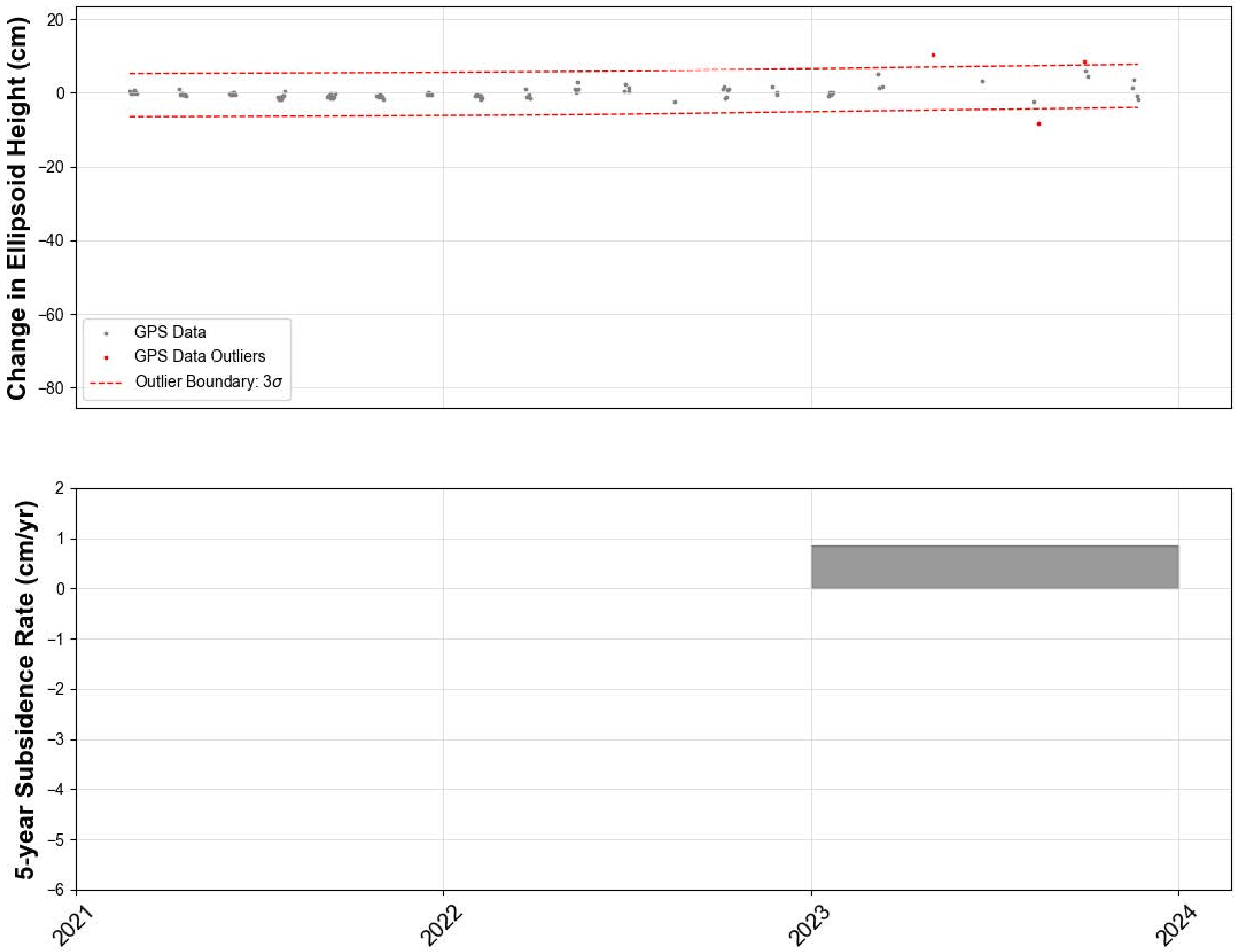




Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P109

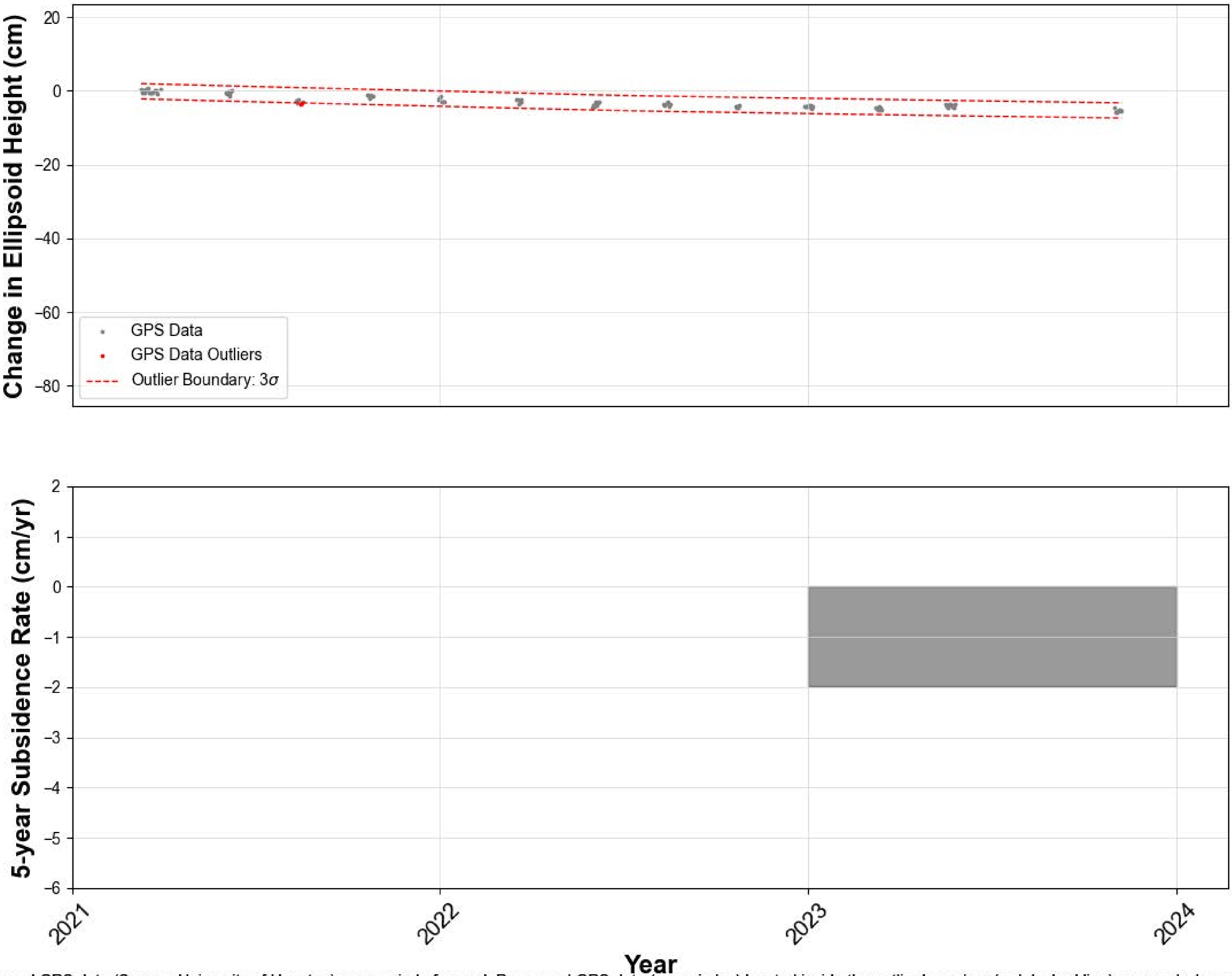
Crosby, TX



Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P110

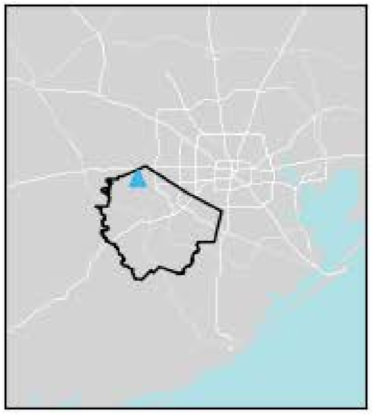
Fresno, TX

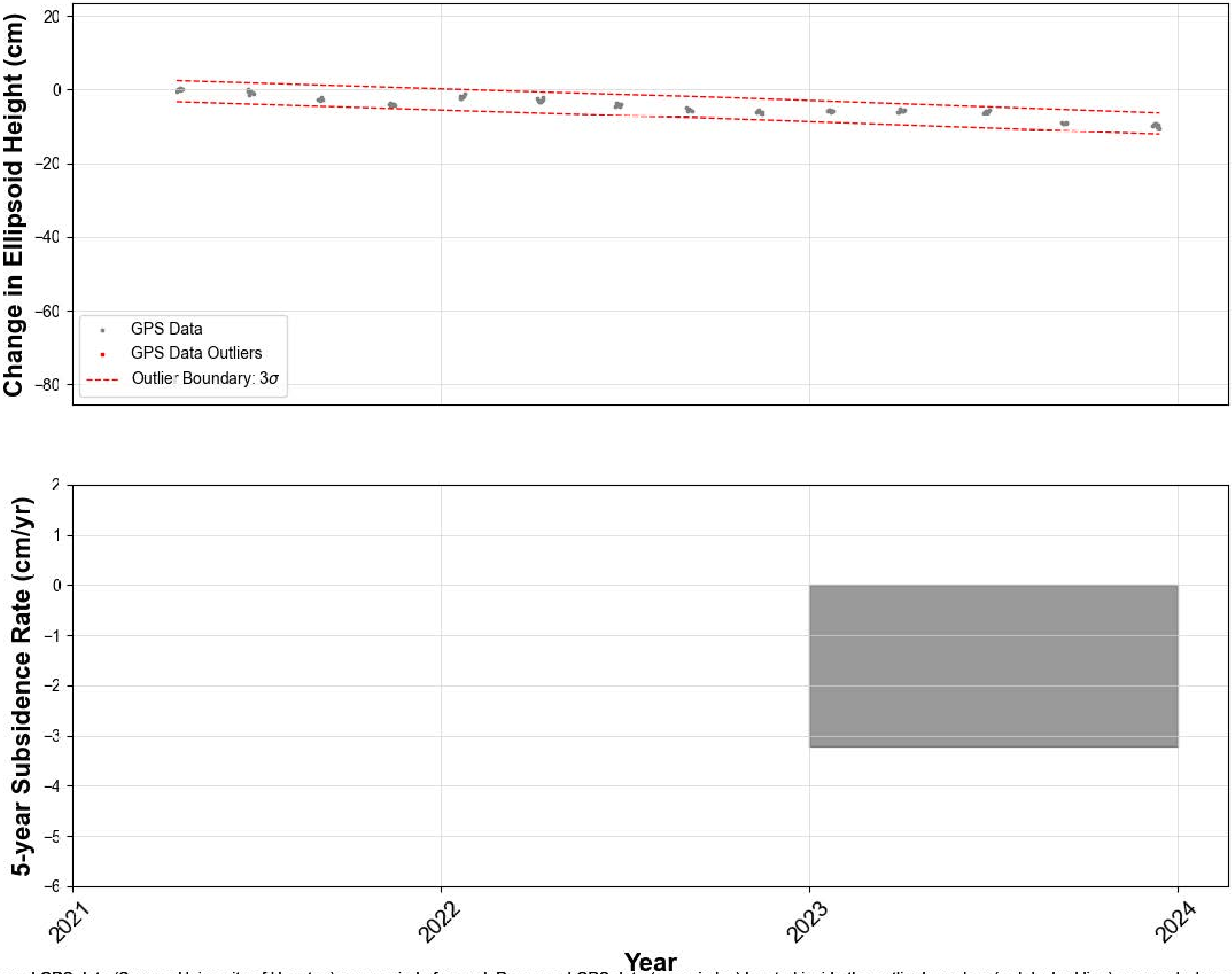


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P111

Katy, TX

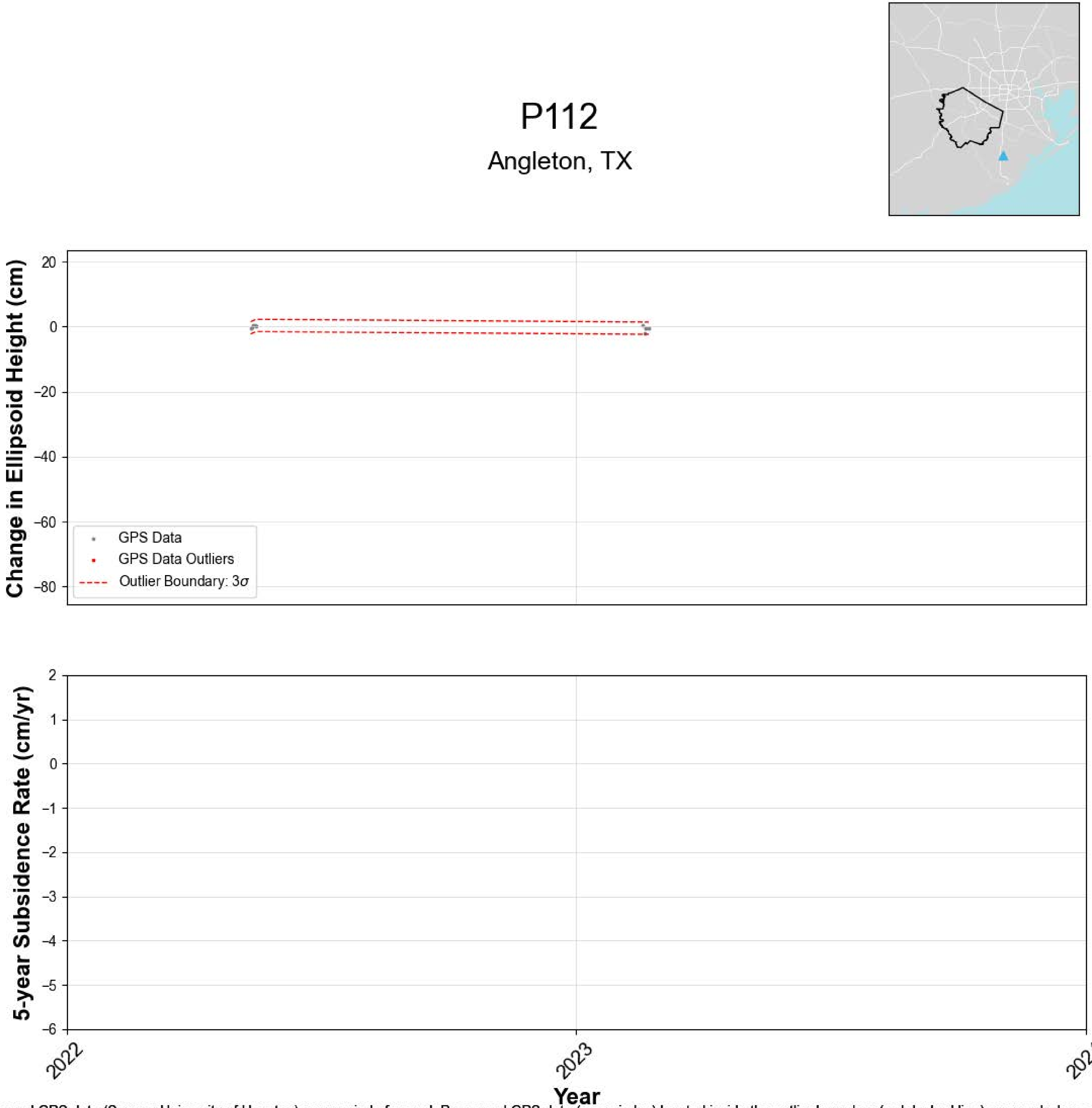




Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P112

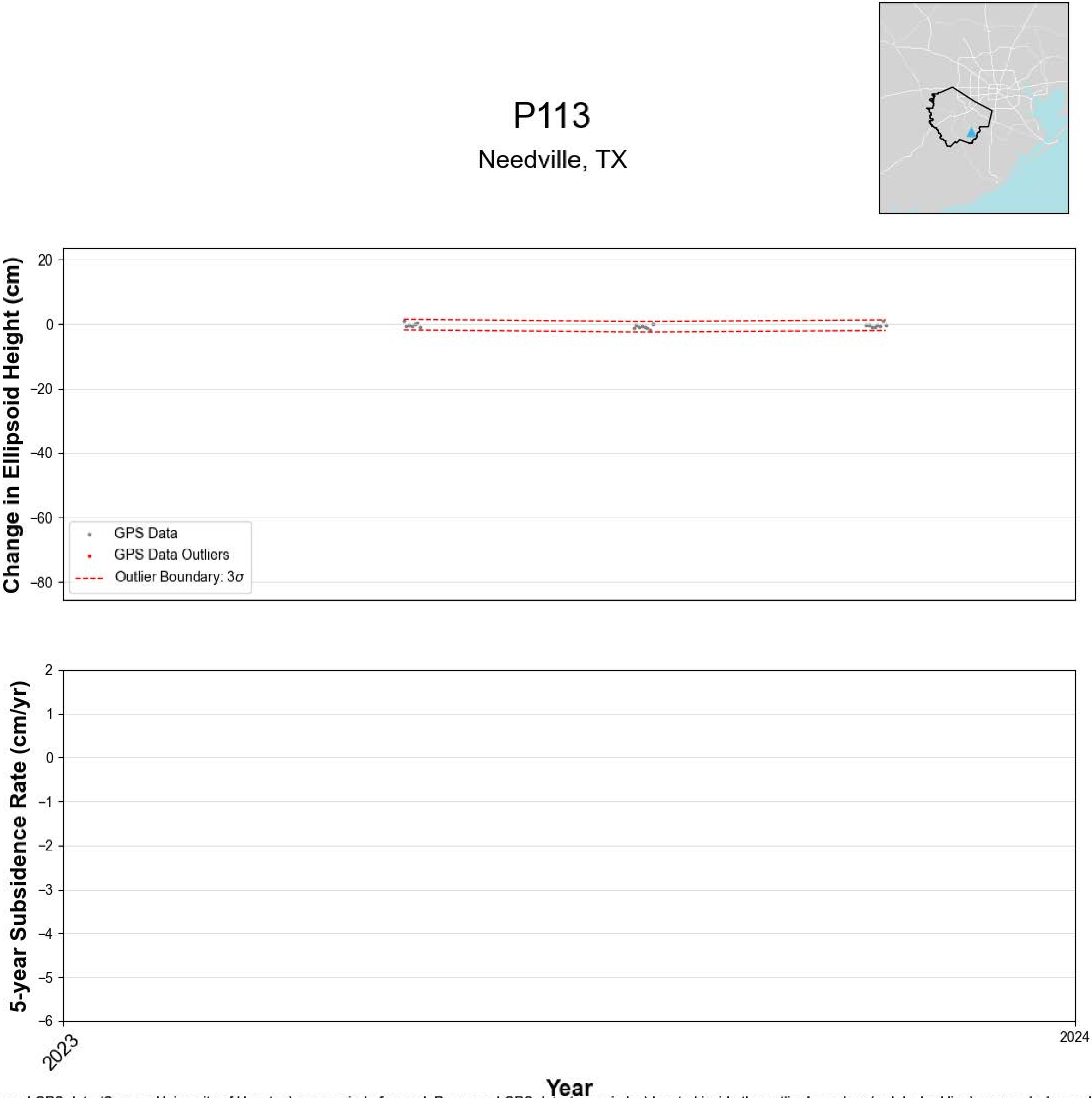
Angleton, TX



Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

P113

Needville, TX



Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

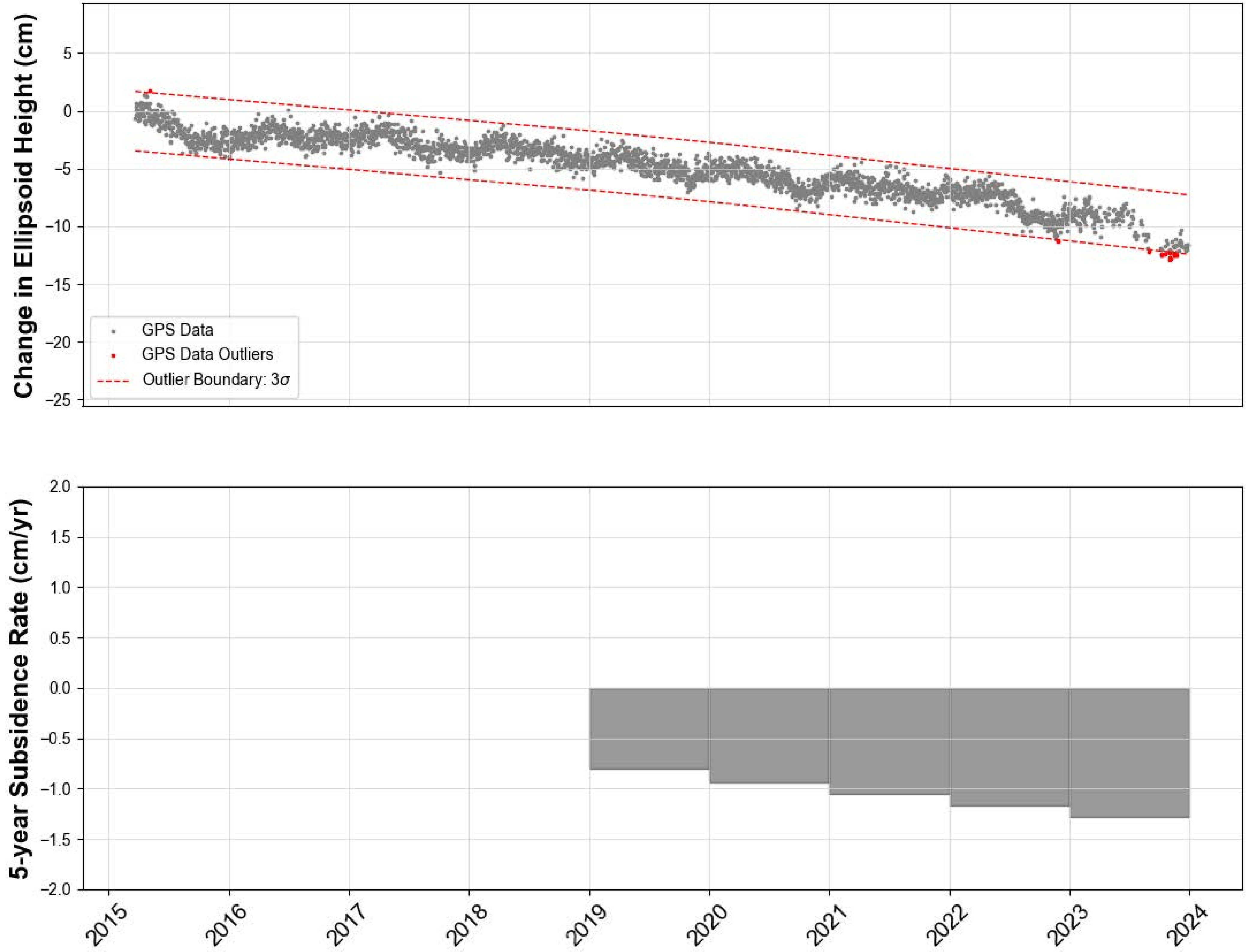
P114

Missouri City, TX

Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

PWES

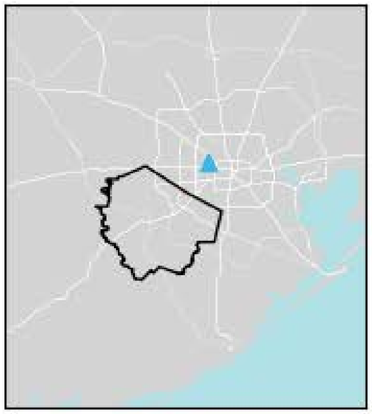
Spring, TX

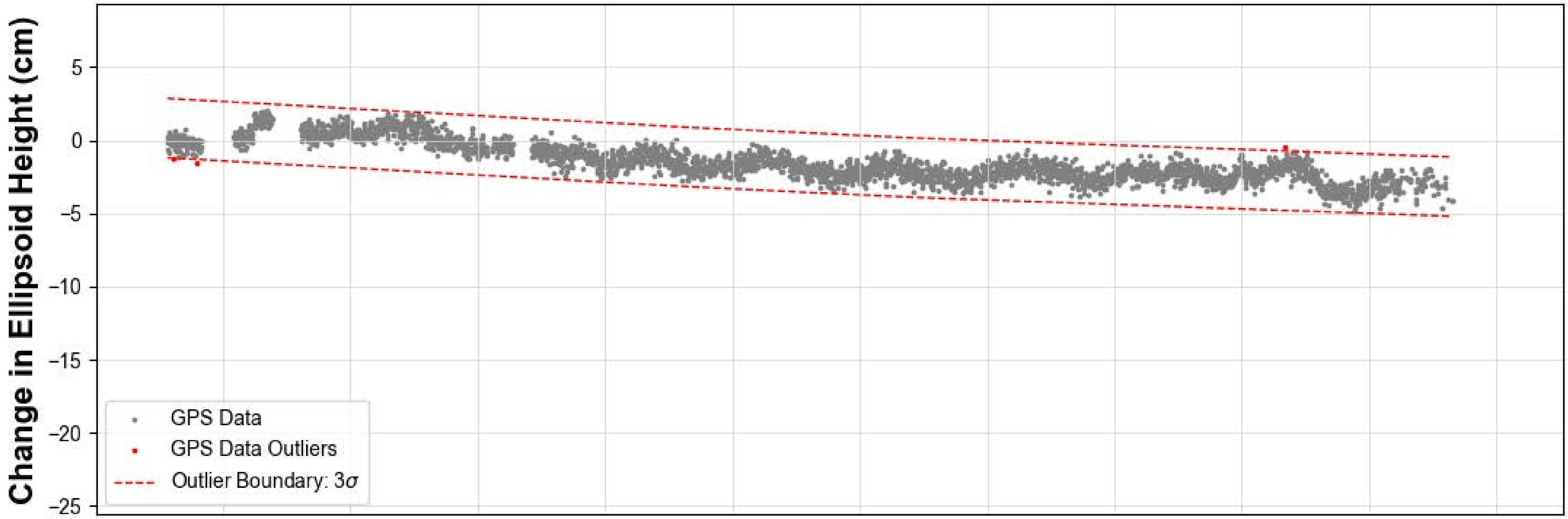


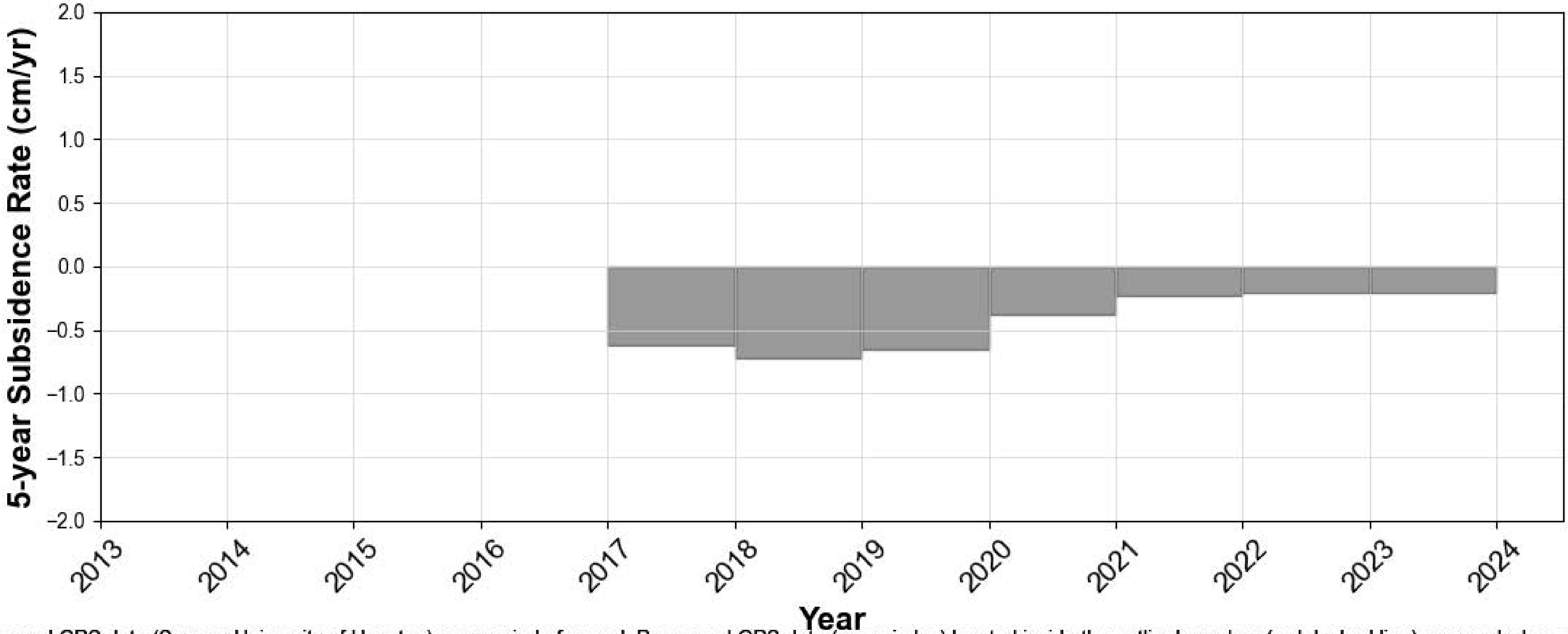
Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

RDCT

Houston, TX



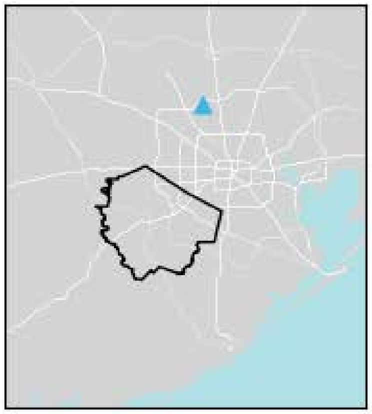


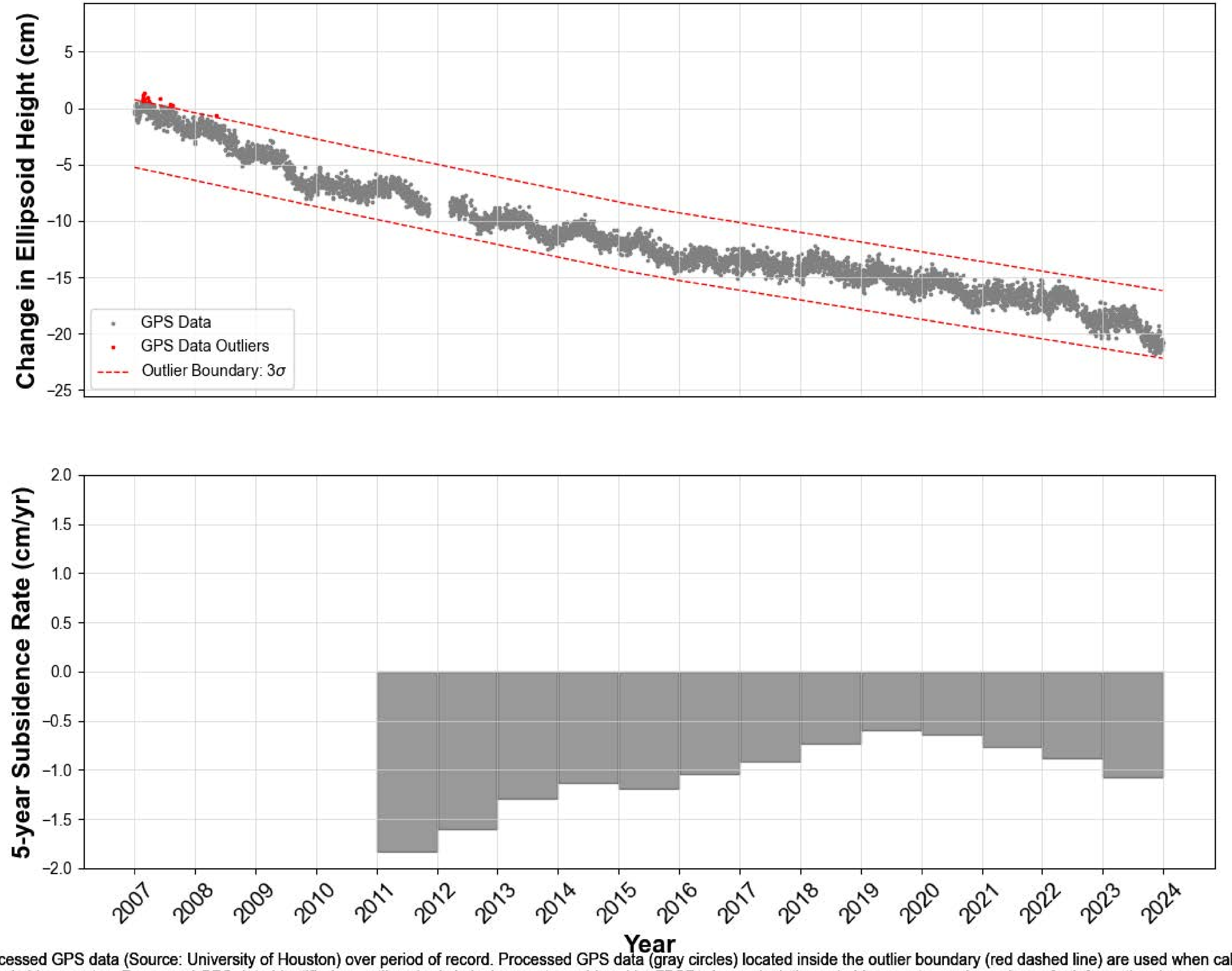


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

ROD1

Spring, TX

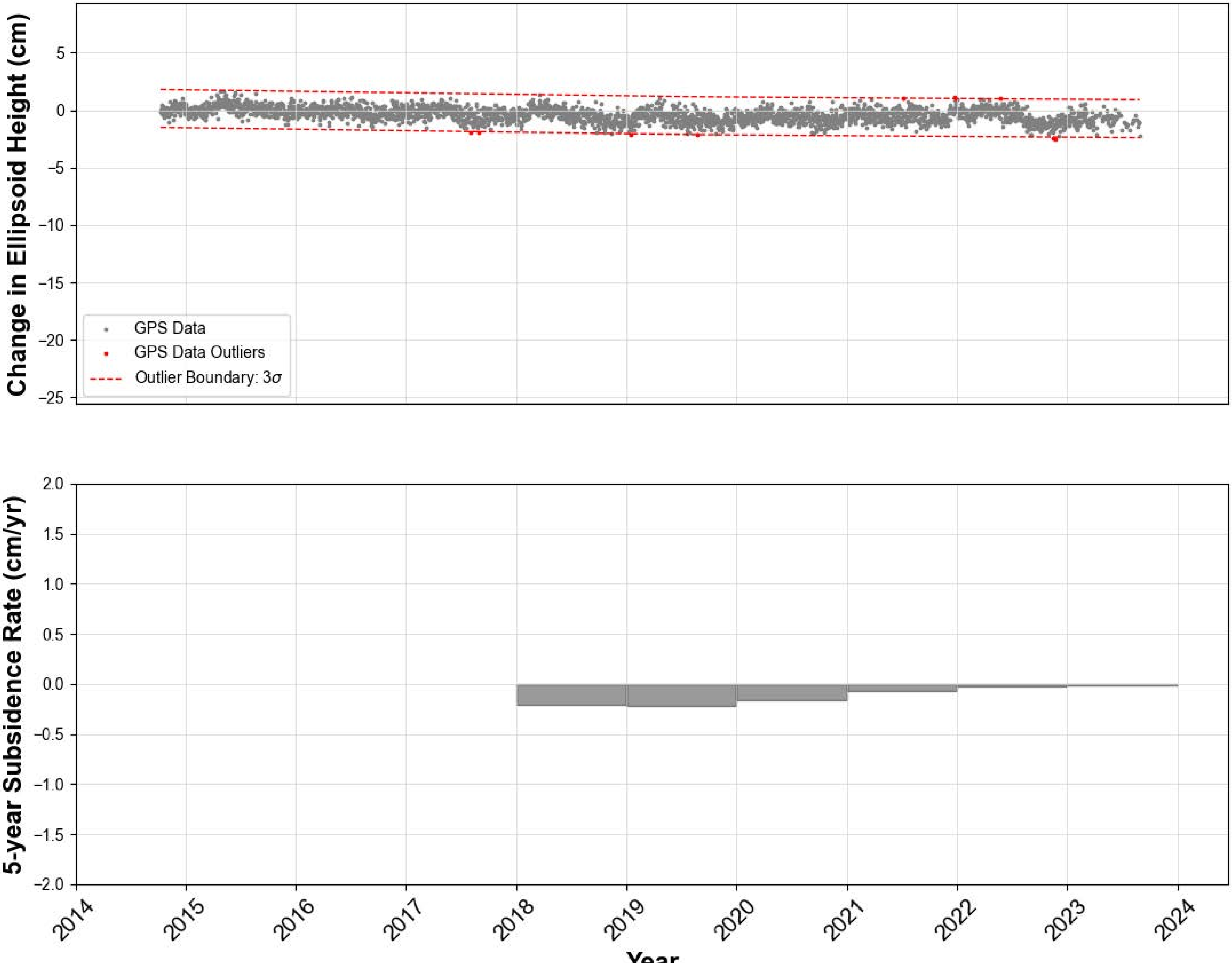




Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

RPFB

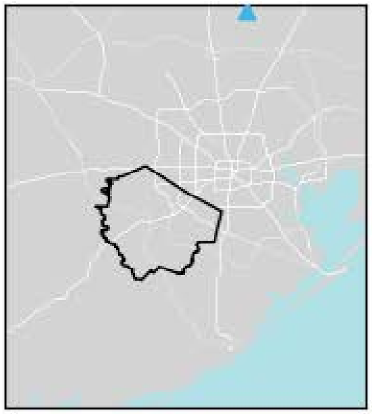
Sienna, TX

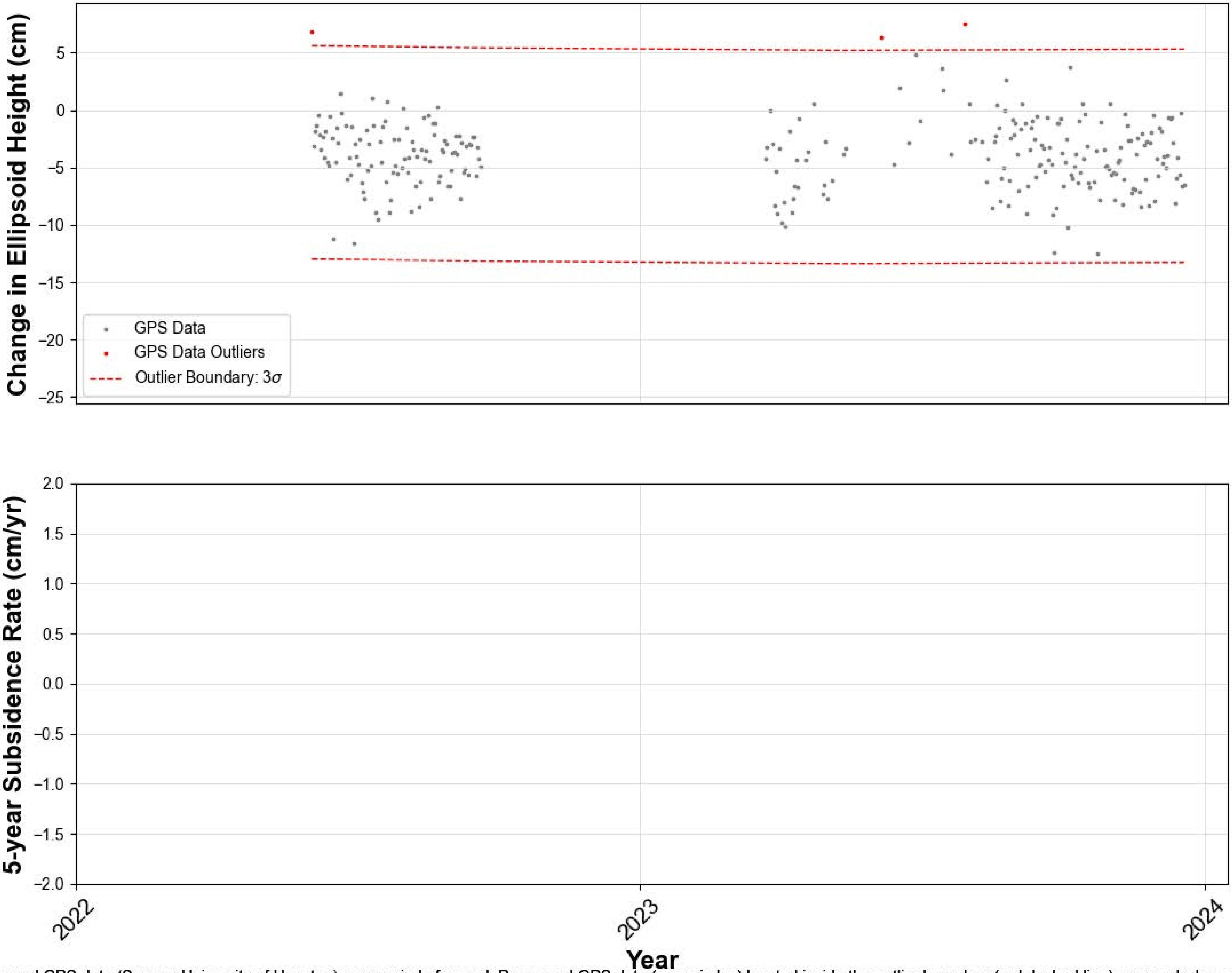


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

SANJ

Willis, TX

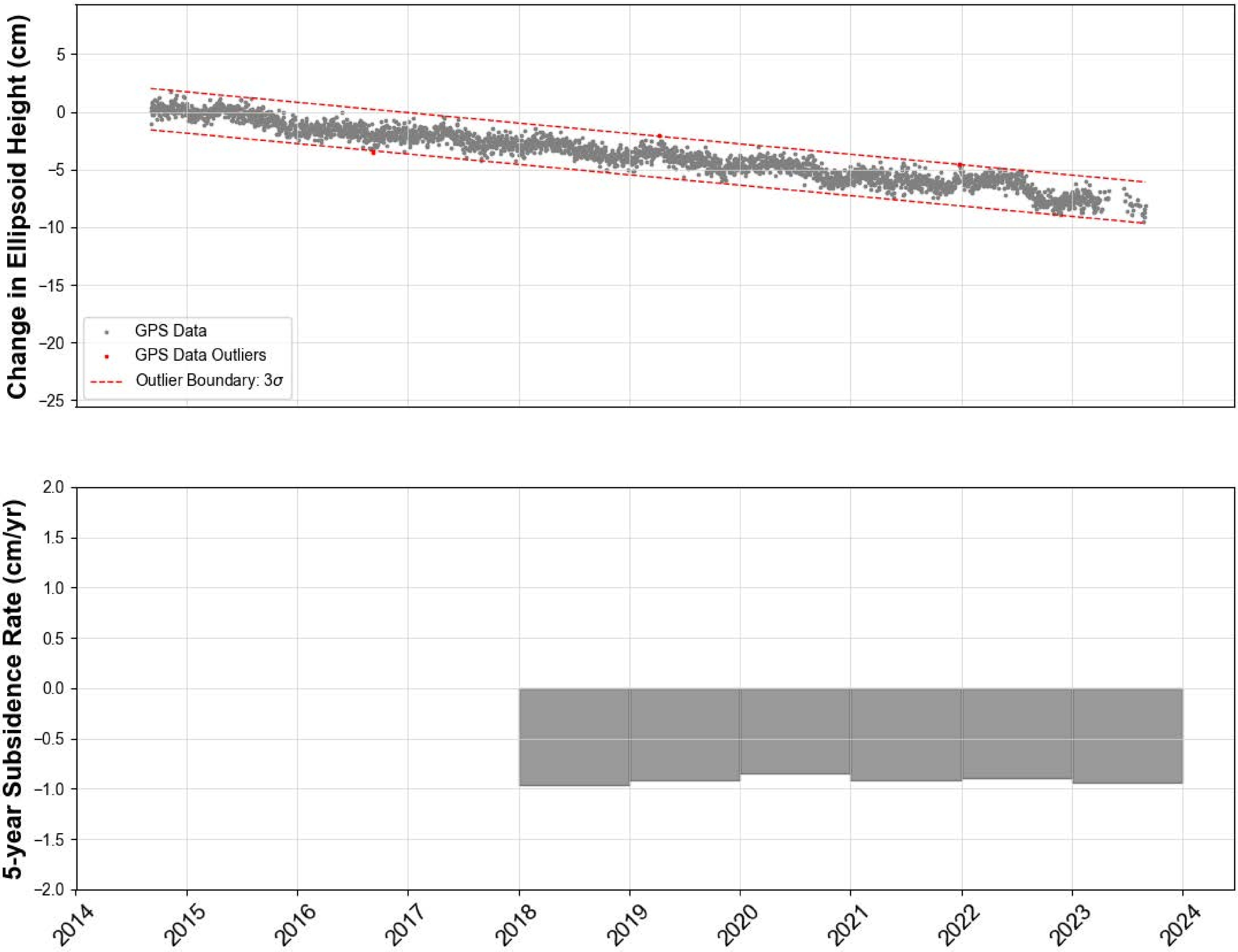




Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

SESG

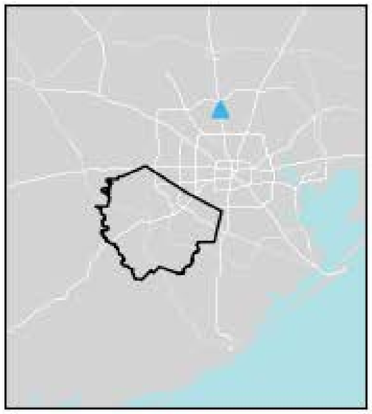
Houston, TX

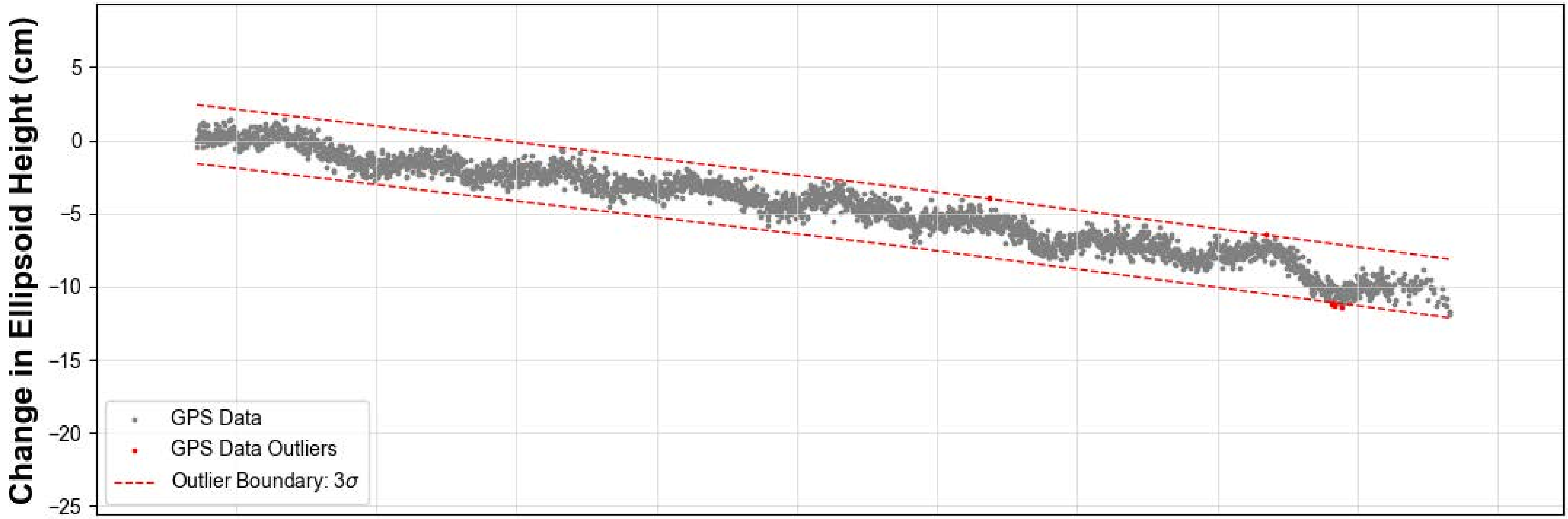


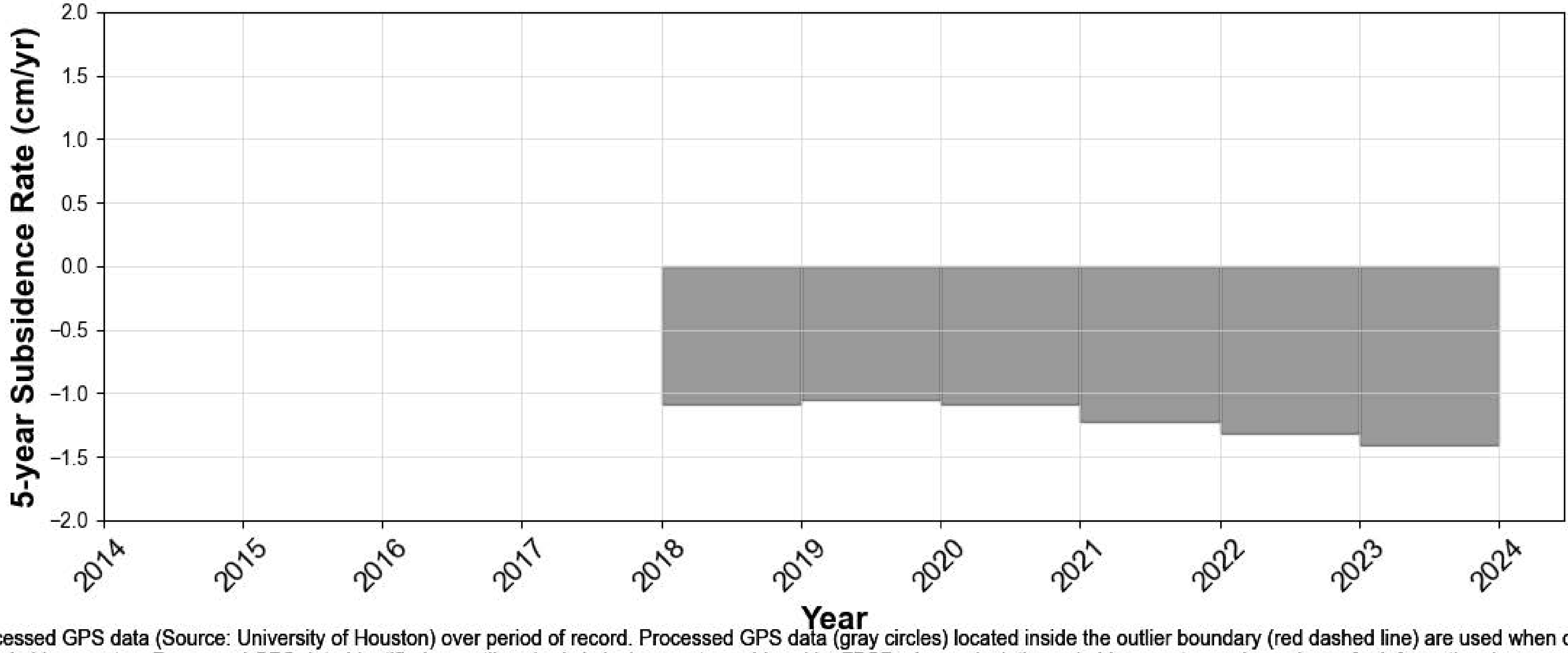
Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

SHSG

Spring, TX



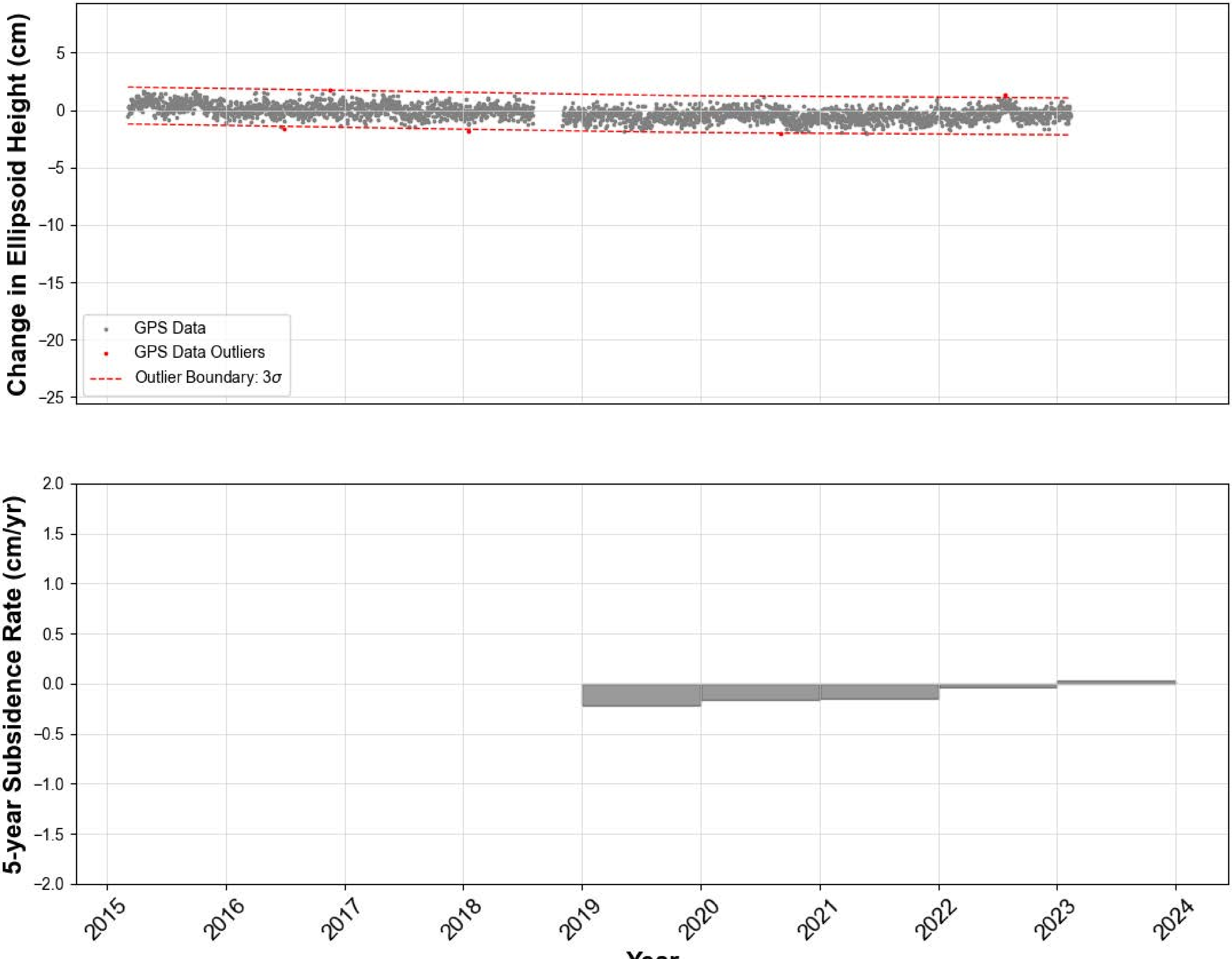




Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

SISD

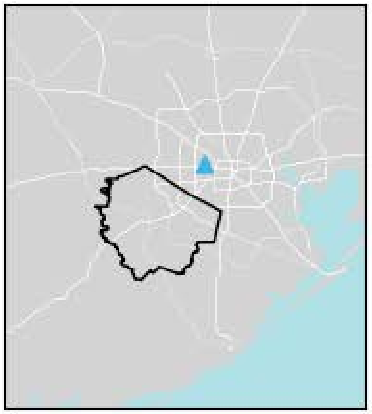
Sealy, TX

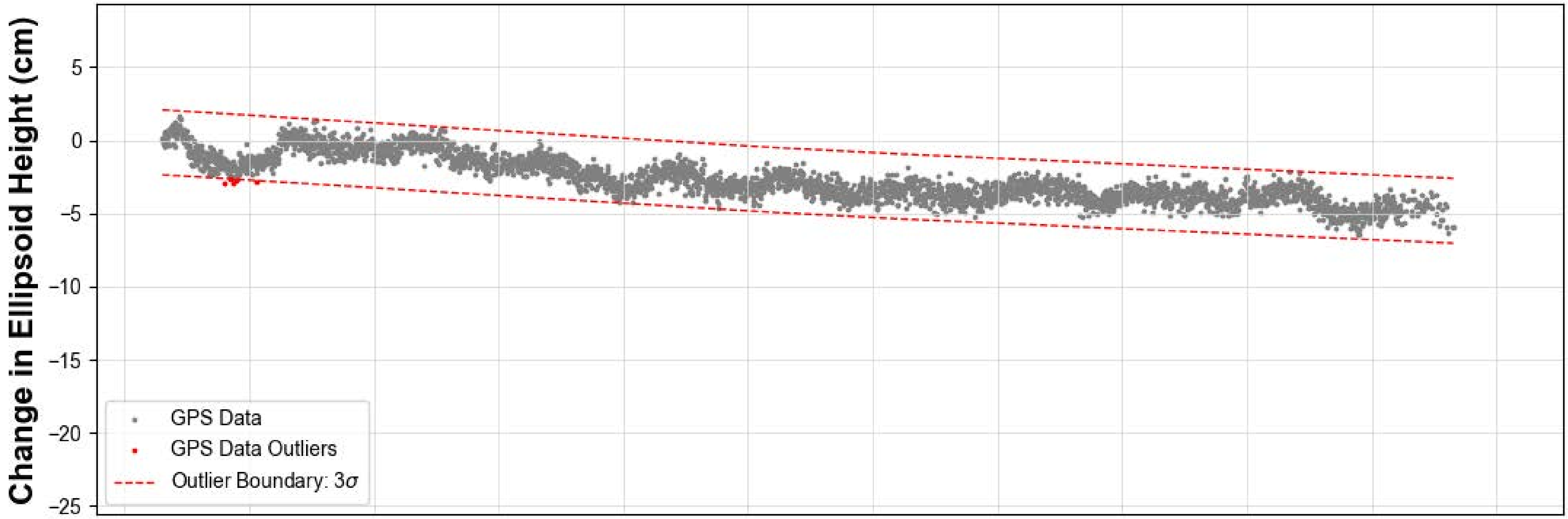


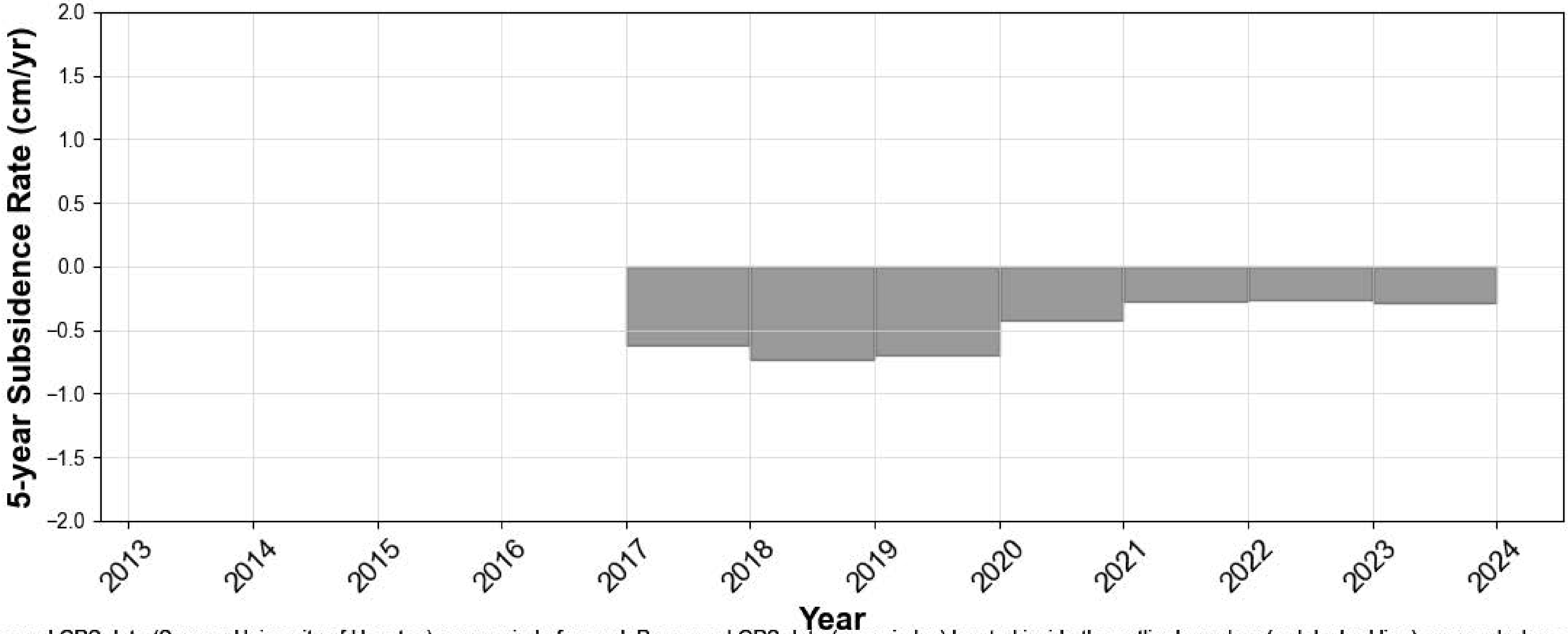
Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

SPBH

Houston, TX



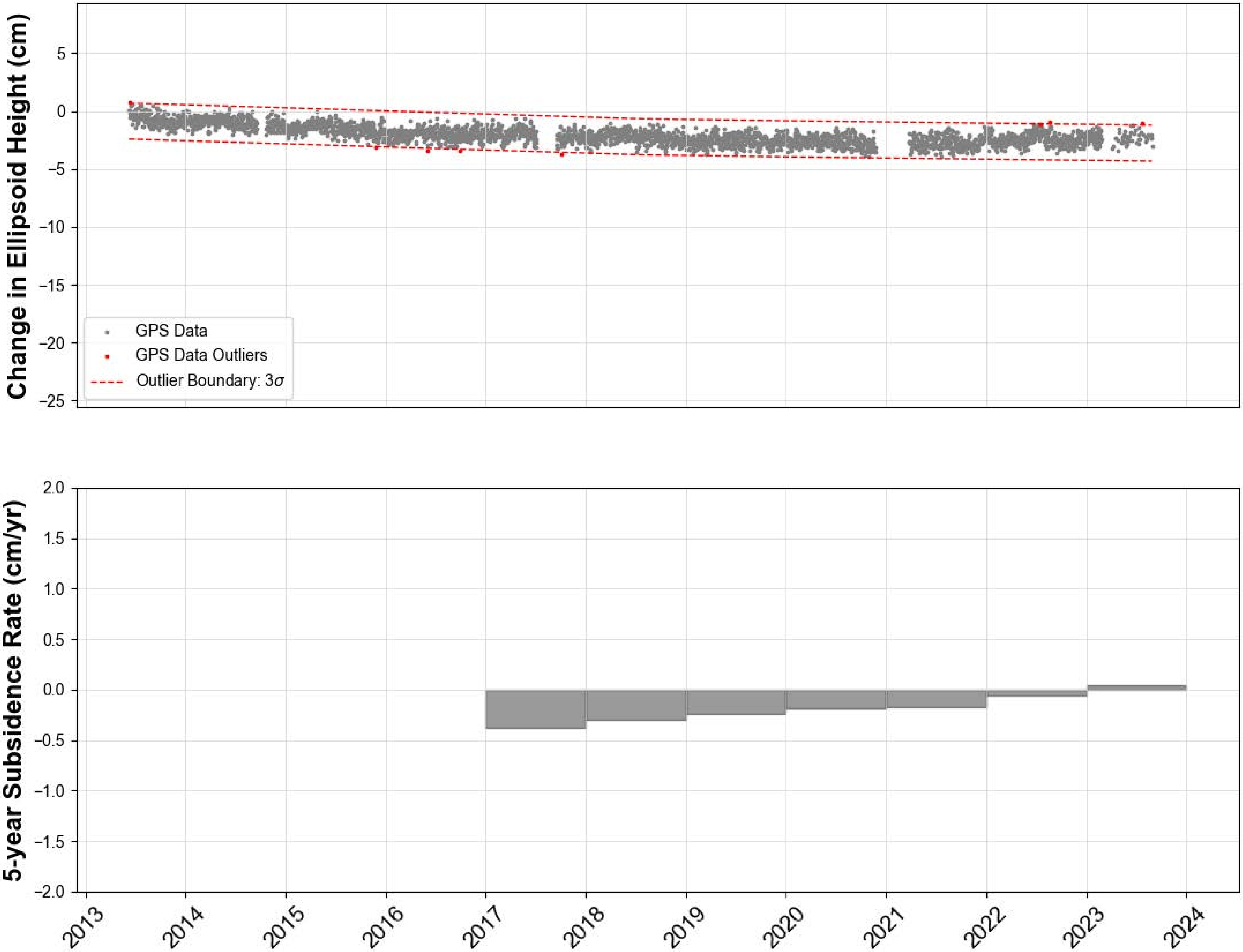




Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

TDAM

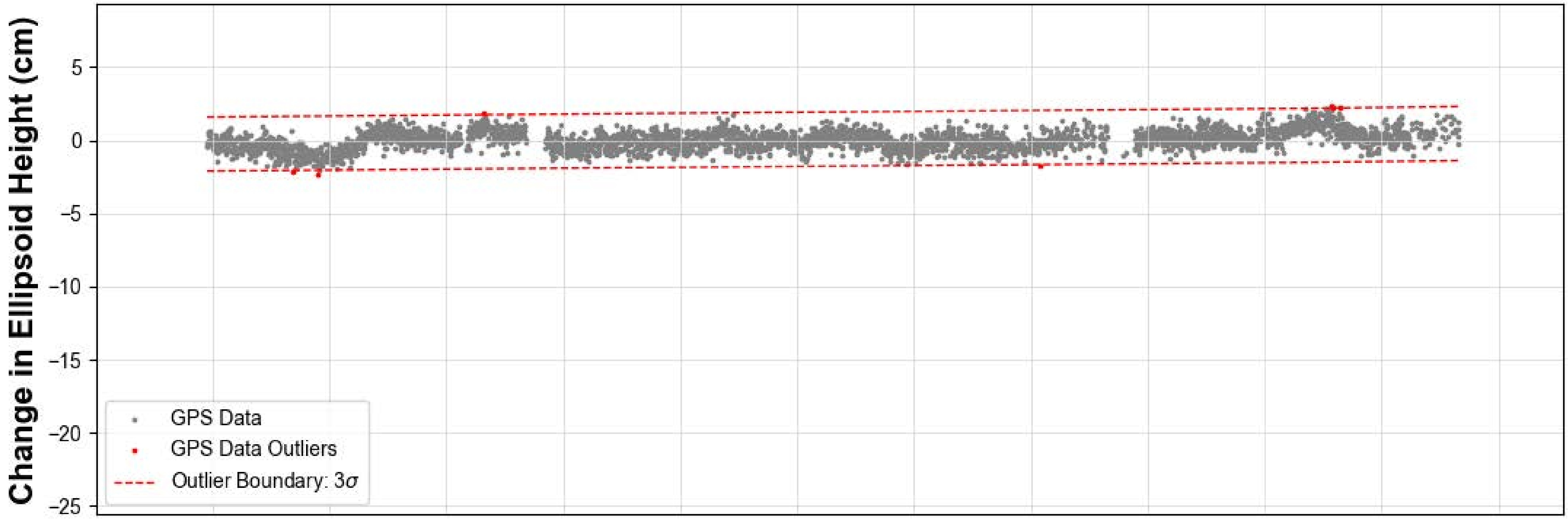
Galveston, TX

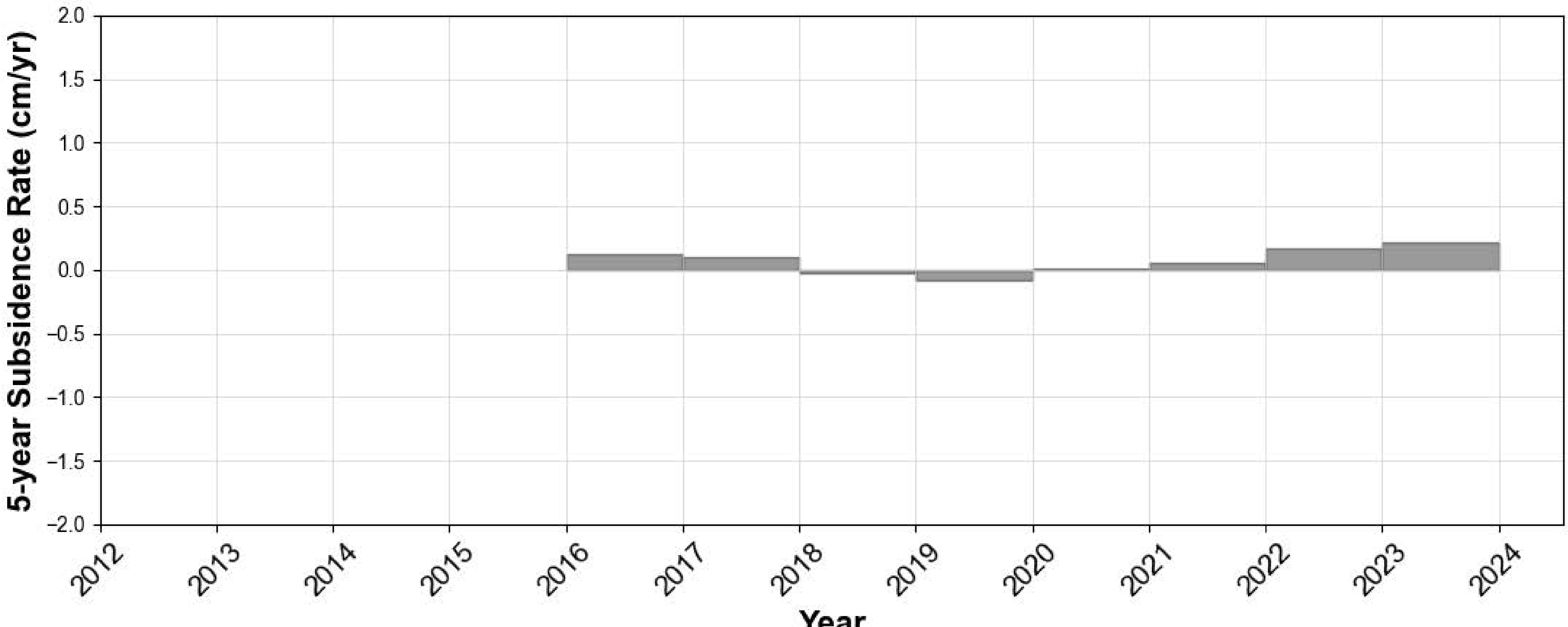


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

THSU

Houston, TX

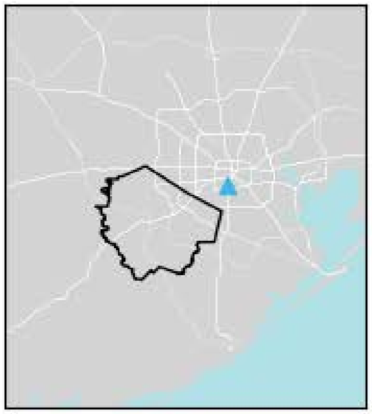


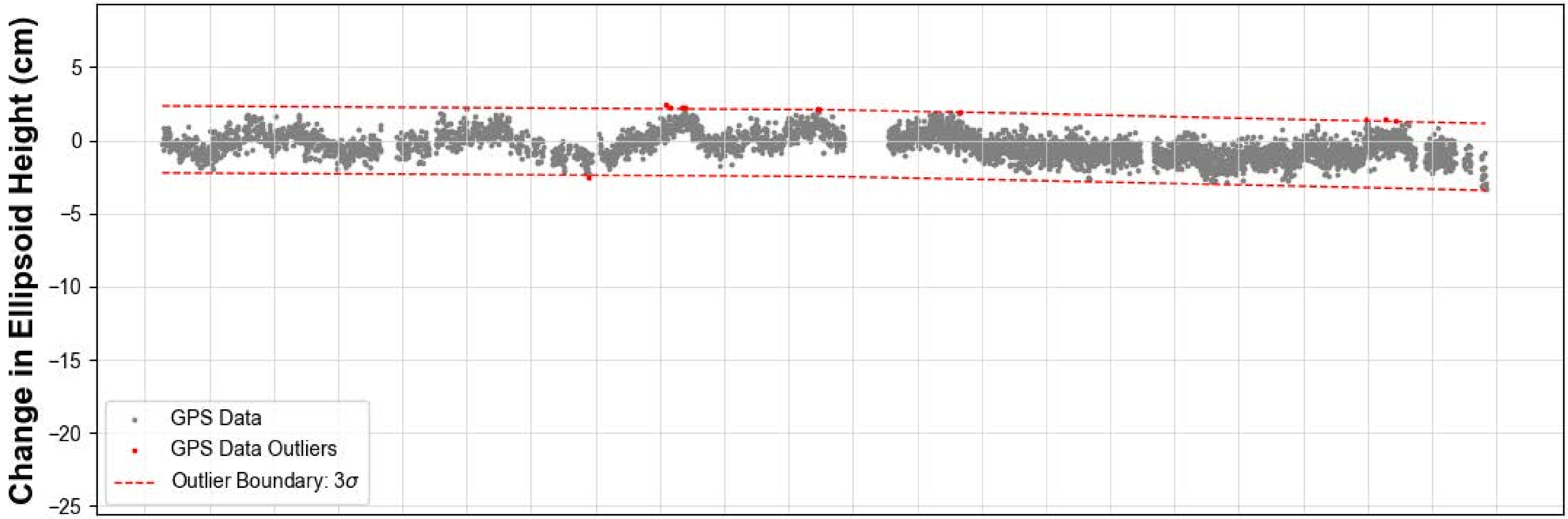


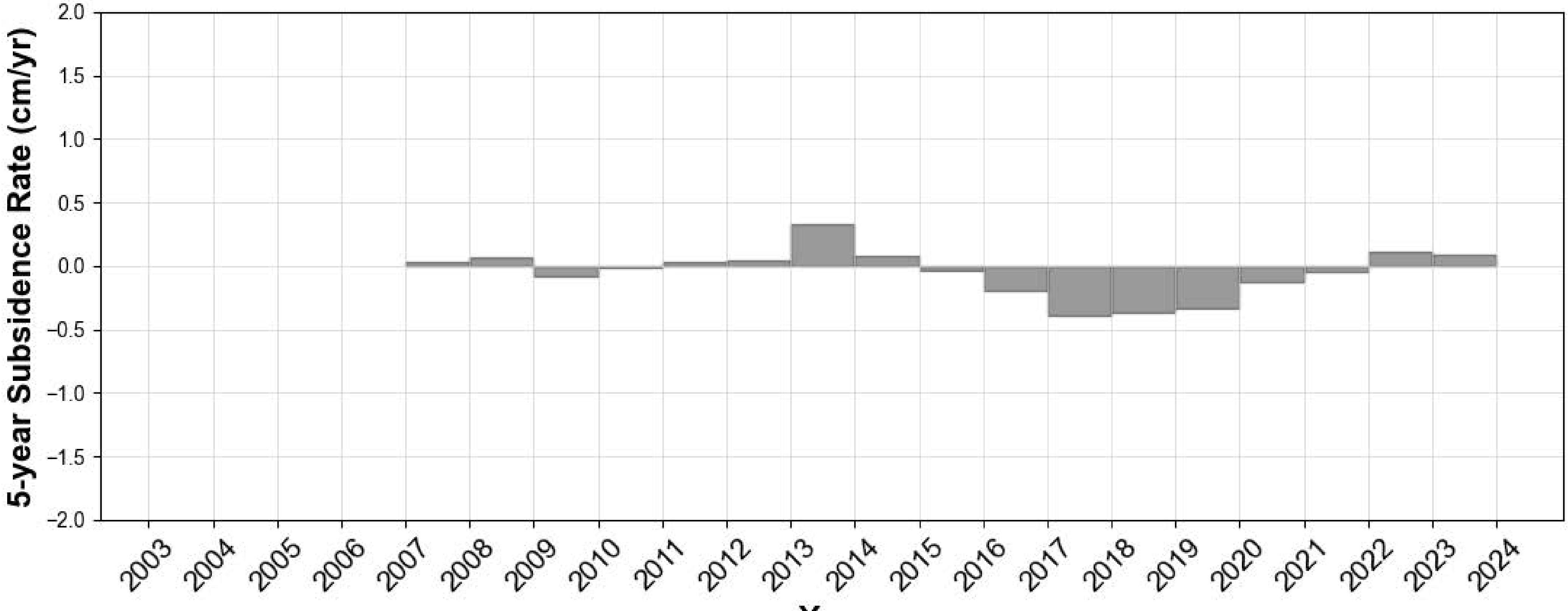
Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

TMCC

Houston, TX



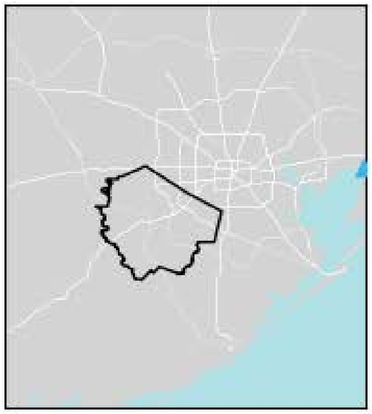


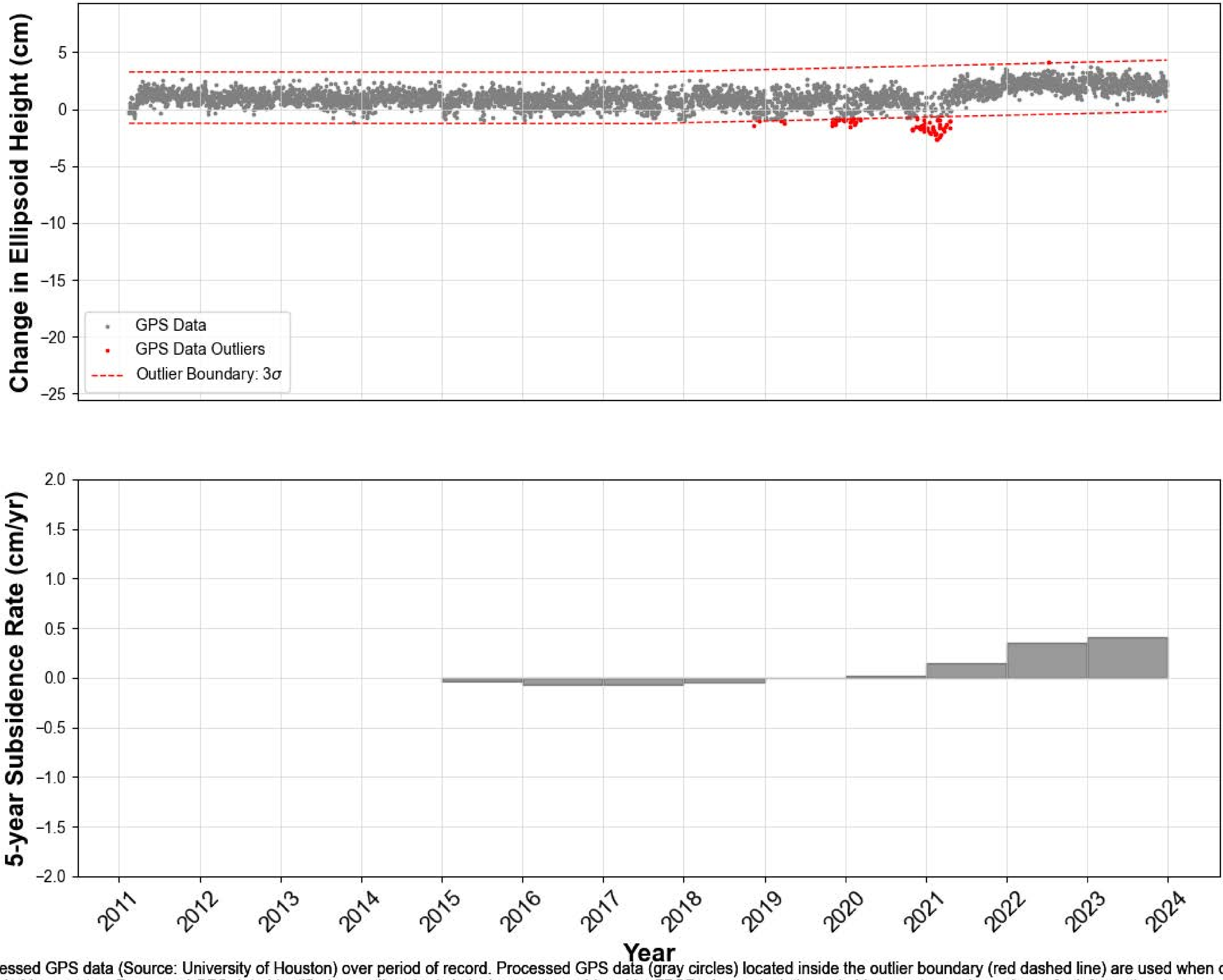


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

TXAC

Anahuac, TX

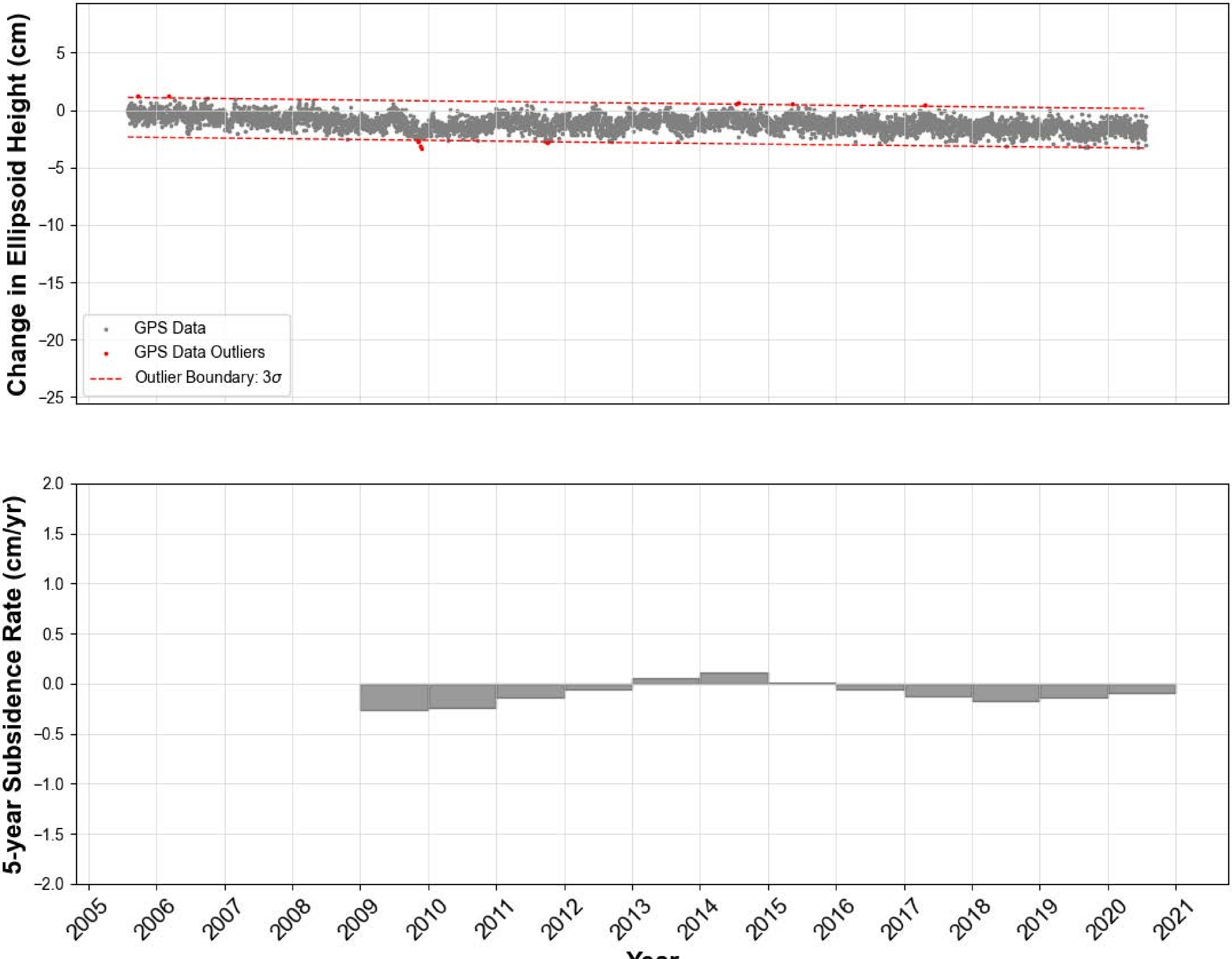




Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

TXAG

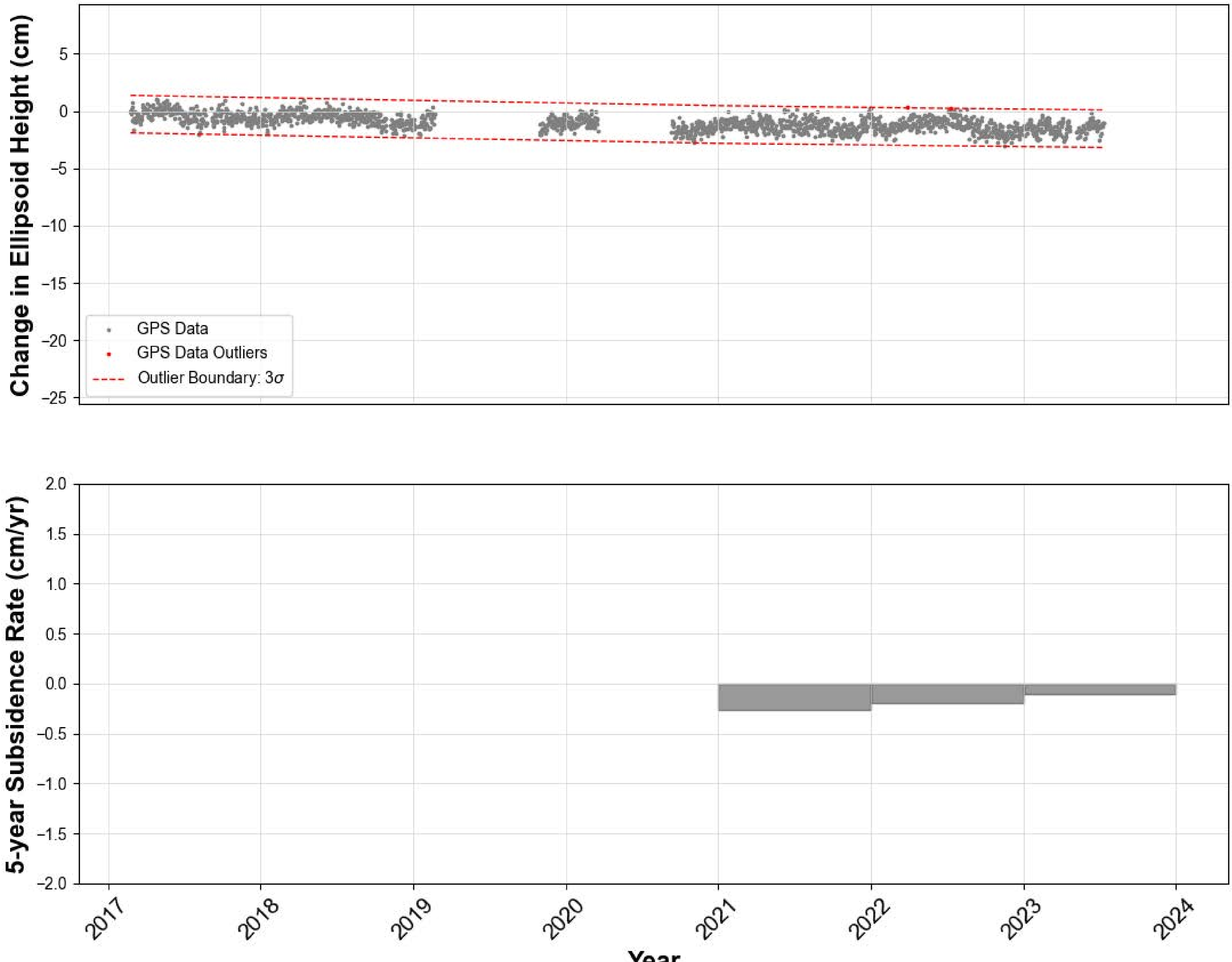
Angleton, TX



Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

TXAV

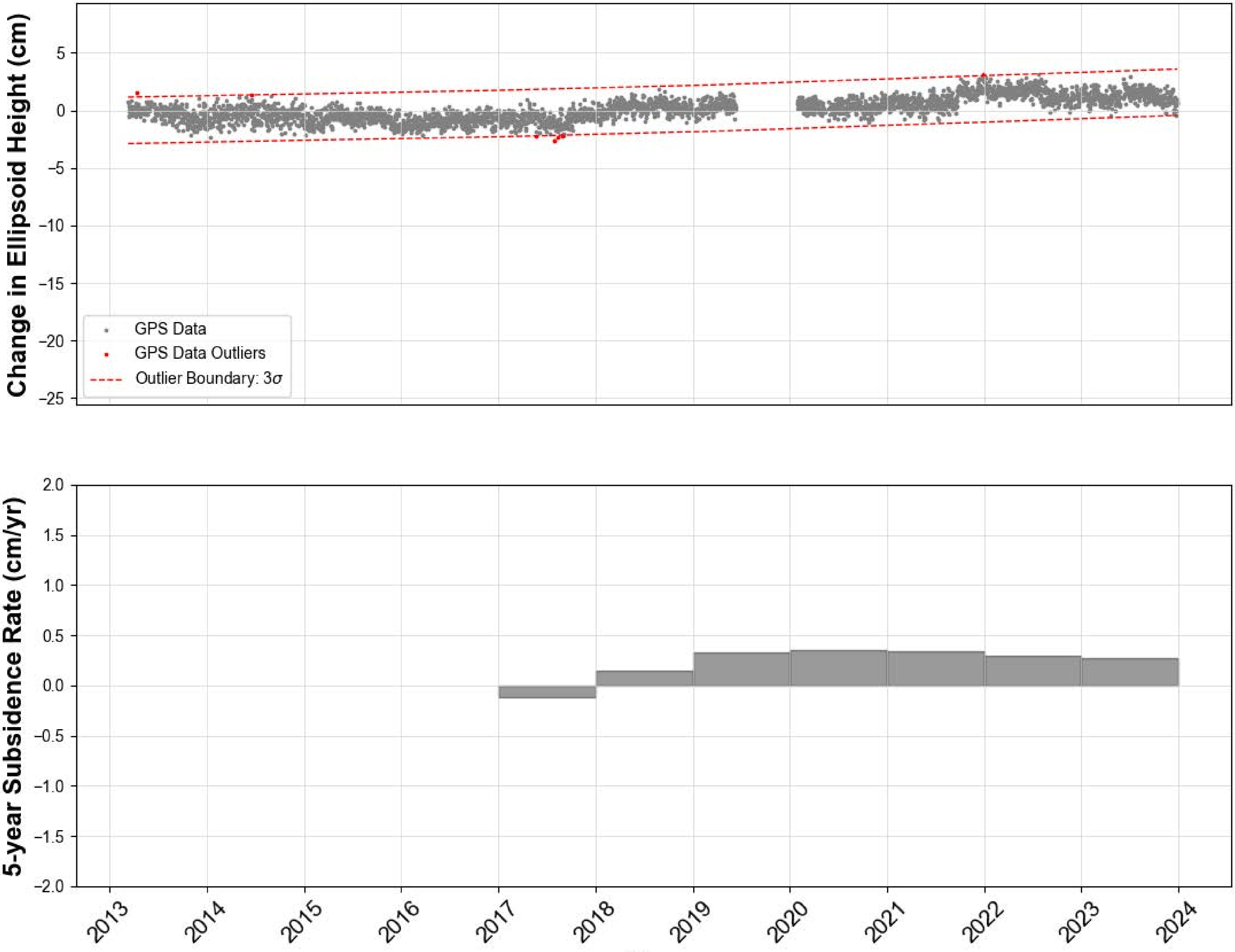
Alvin, TX



Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

TXB1

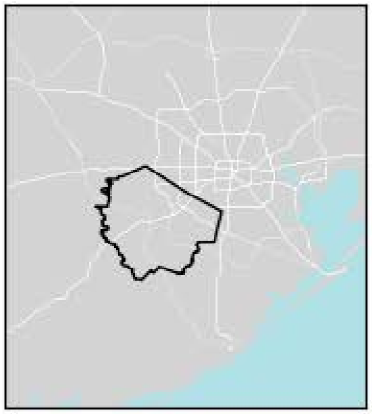
Beaumont, TX

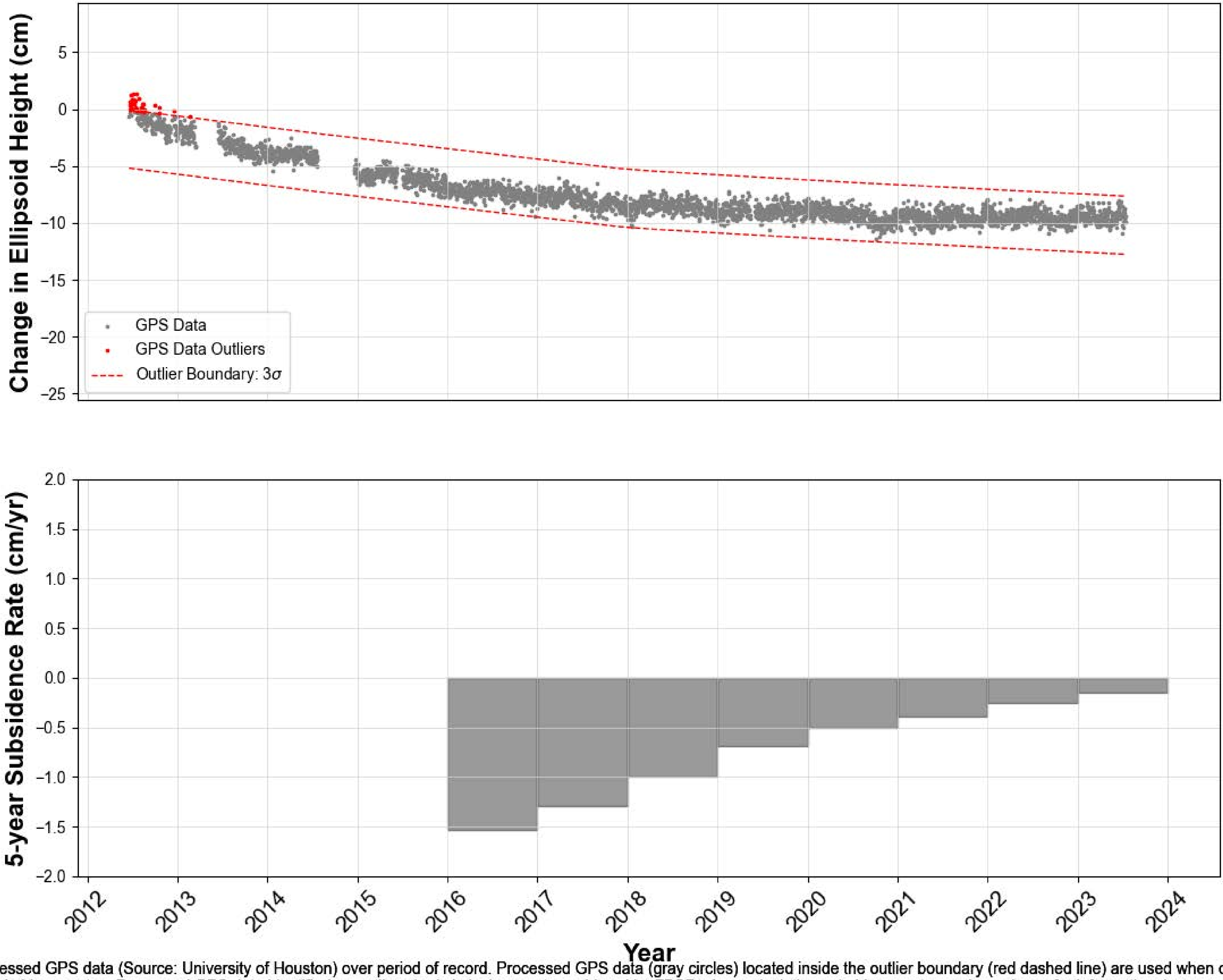


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

TXB2

Beaumont, TX

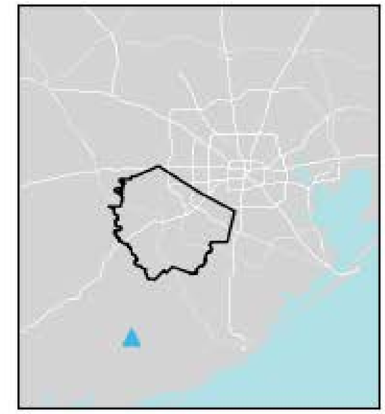


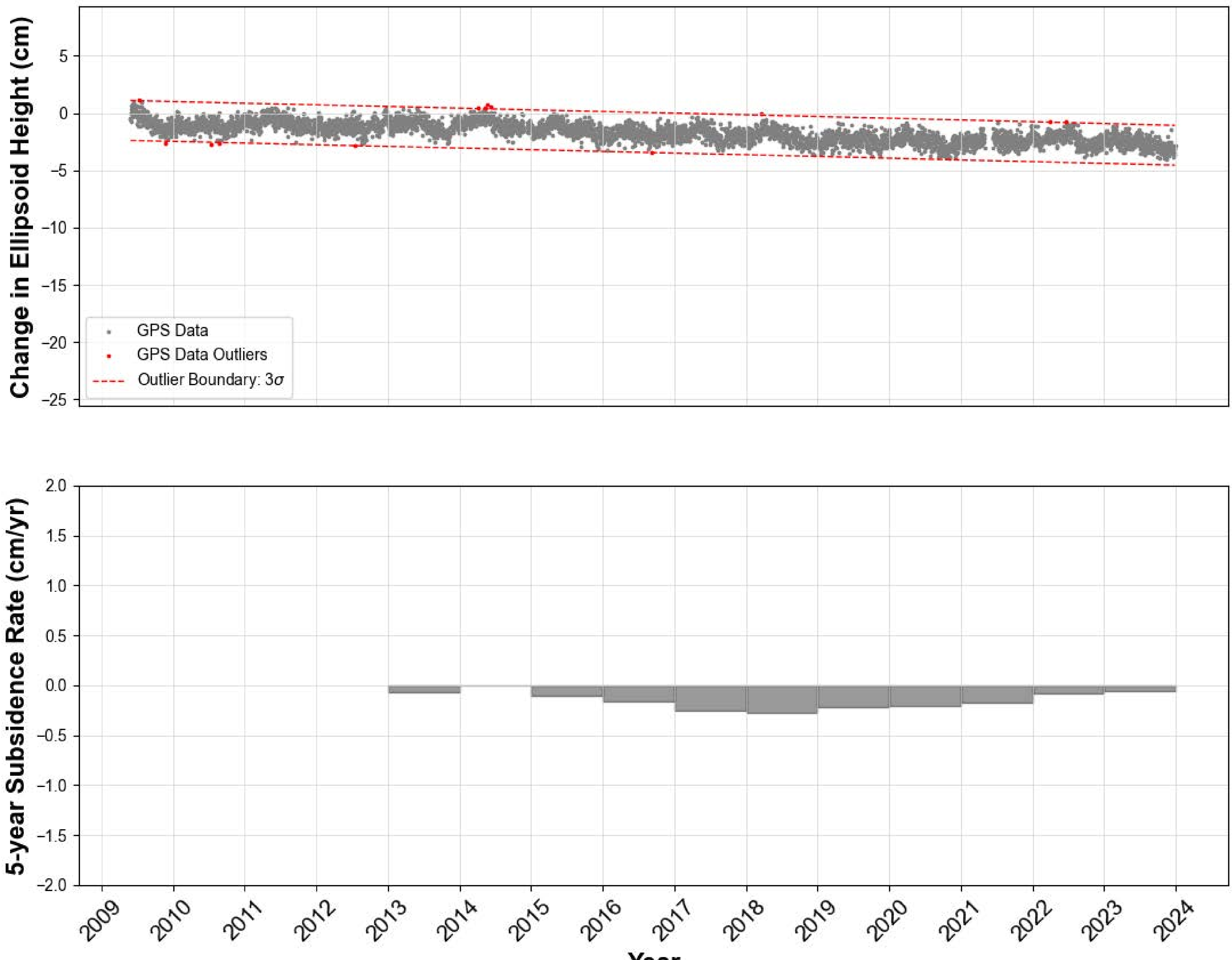


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

TXBC

Bay City, TX

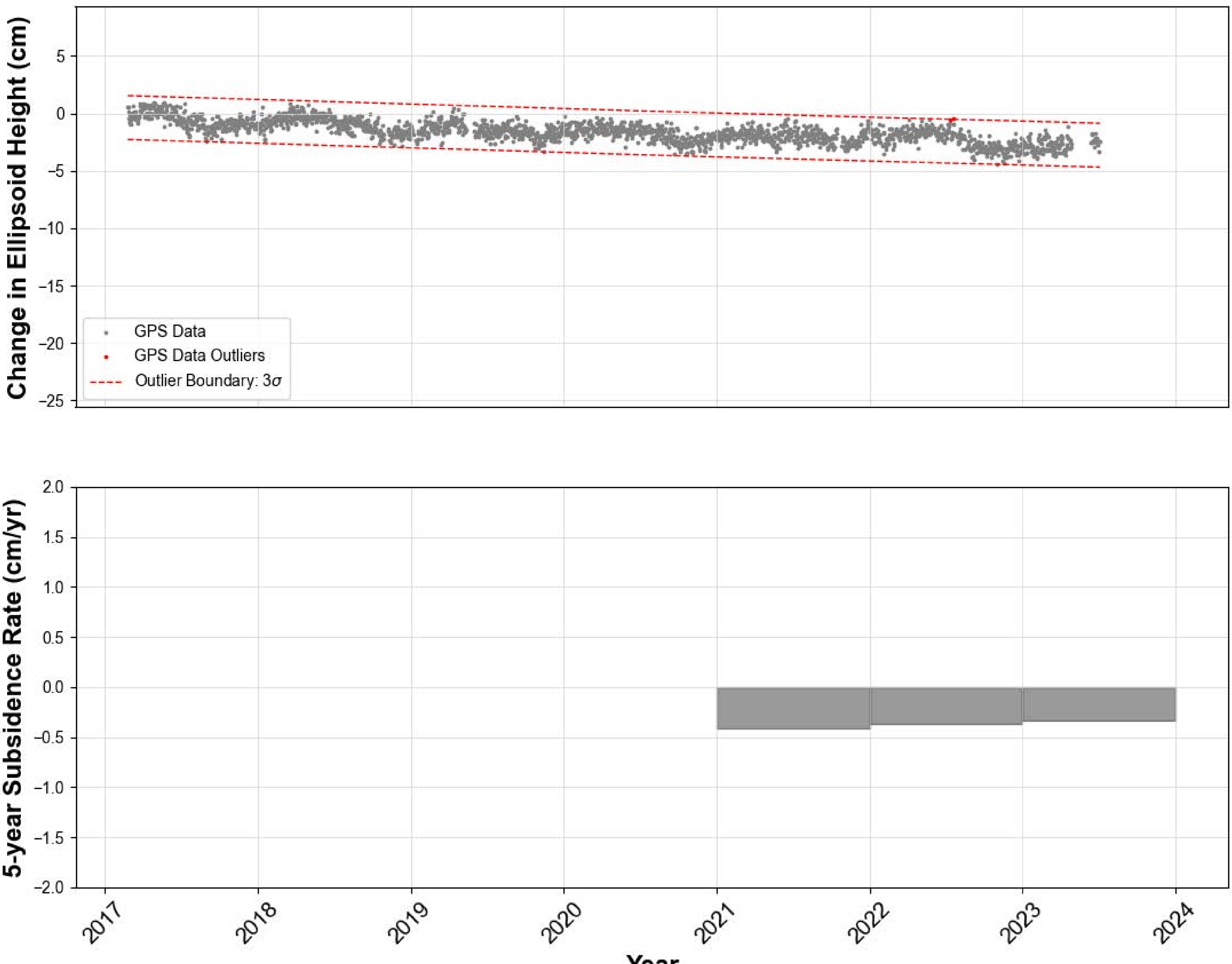




Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

TXBH

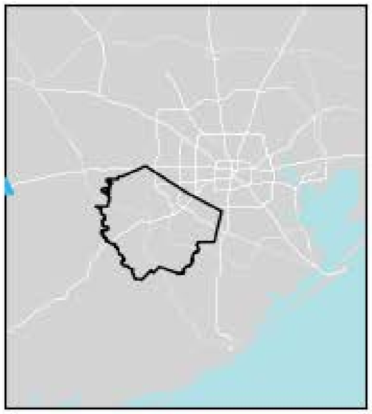
Brookshire, TX

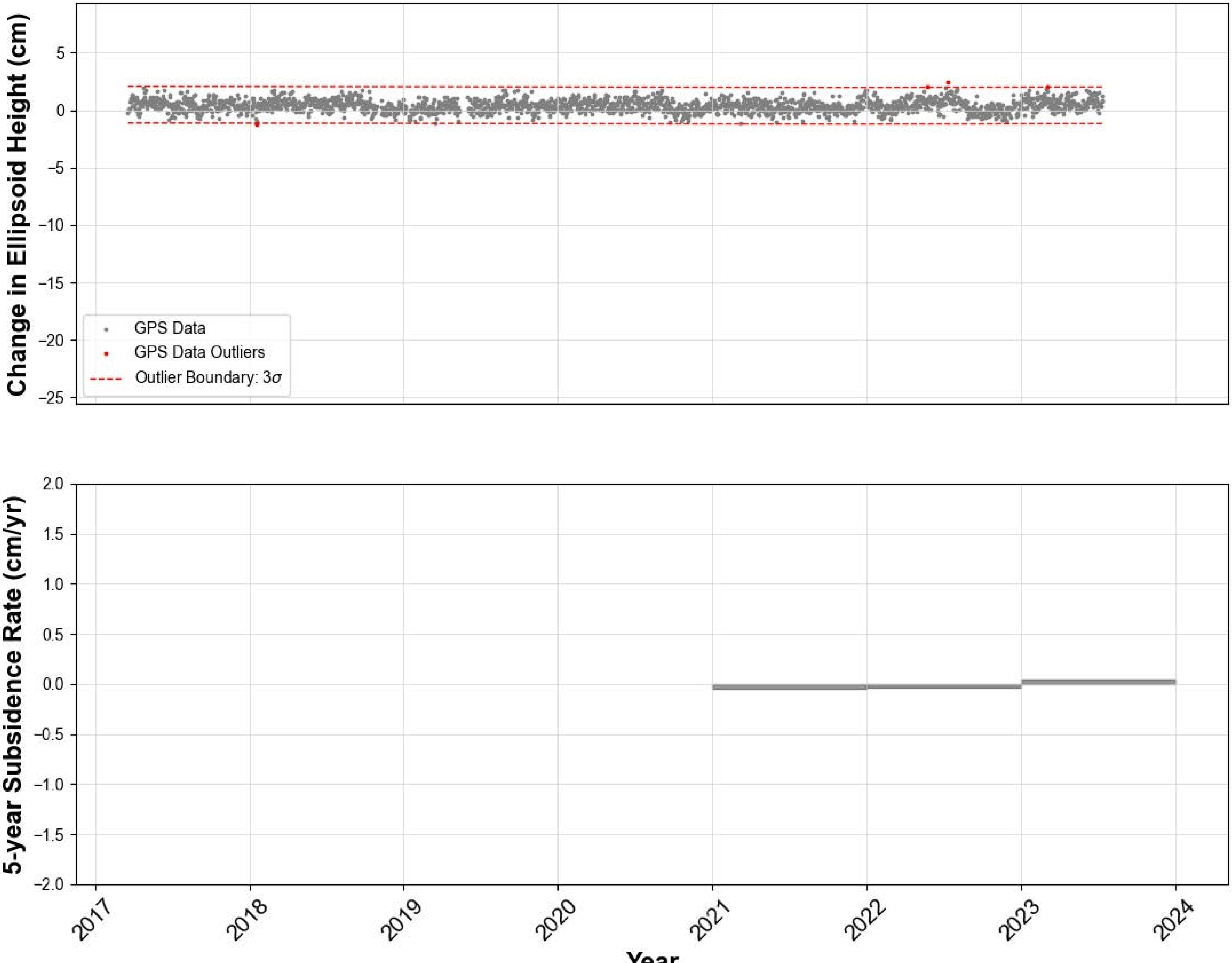


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

TXC5

Columbus, TX

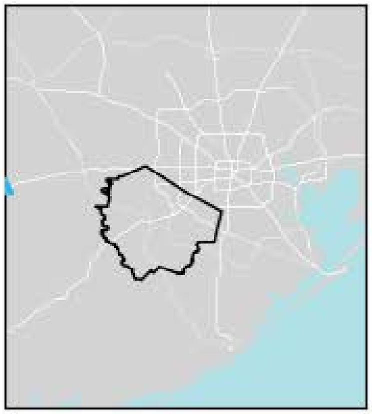


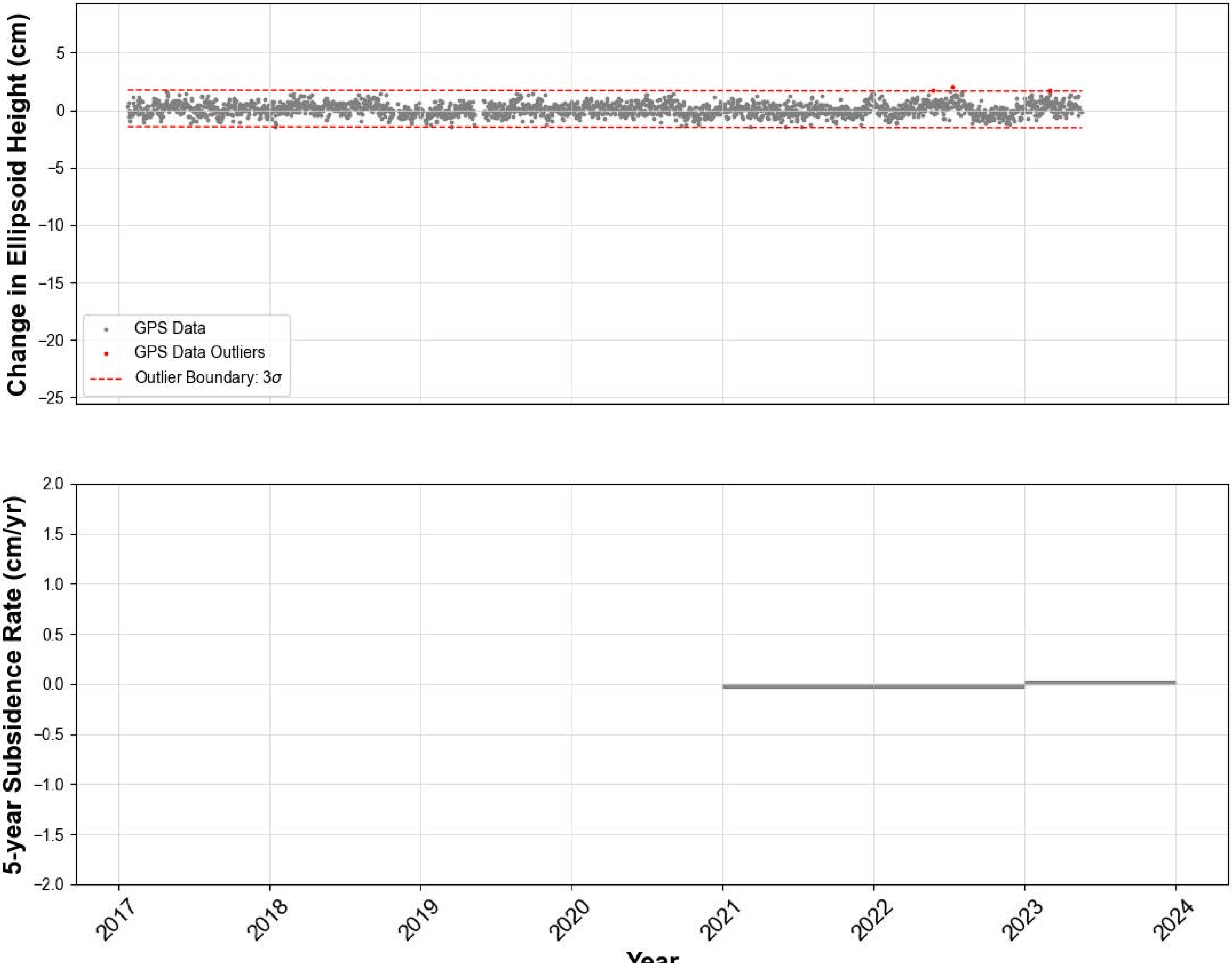


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

TXCF

Columbus, TX

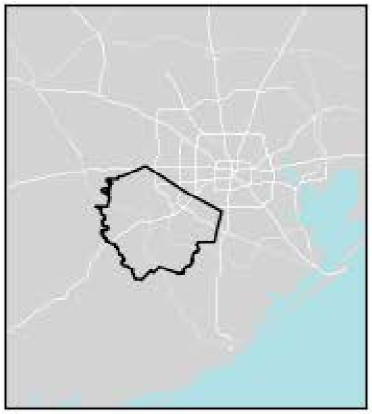


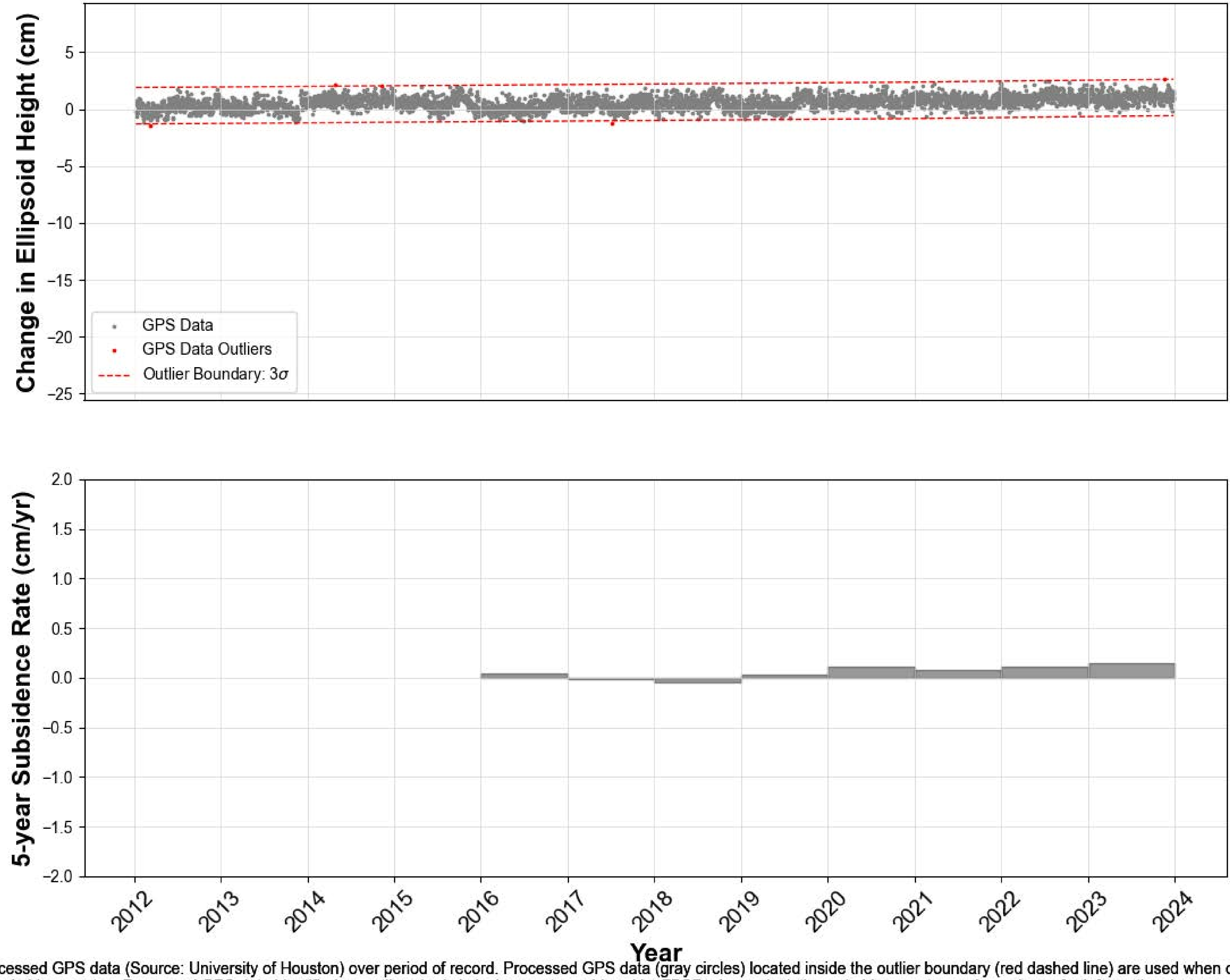


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

TXCK

Crockett, TX

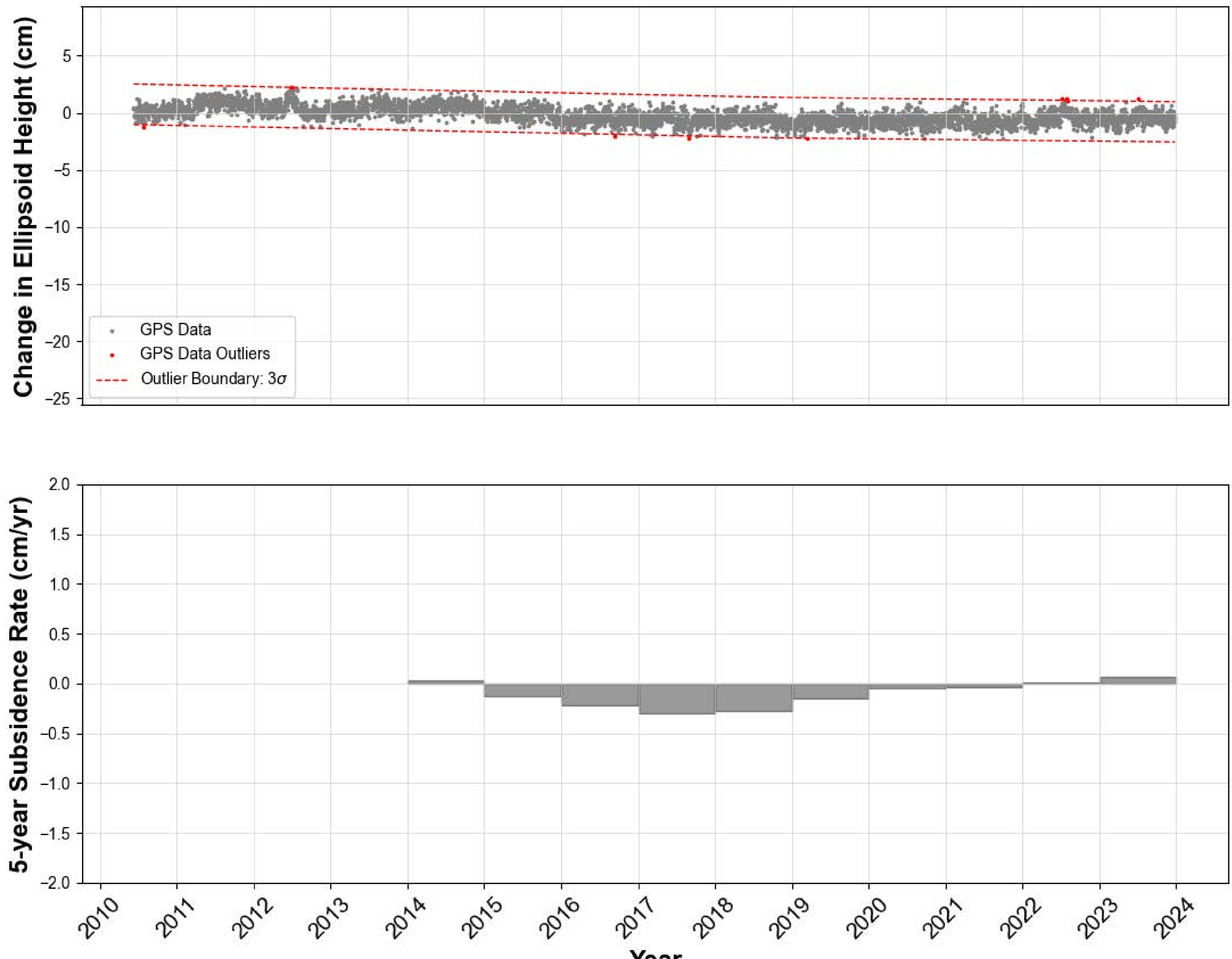




Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

TXCM

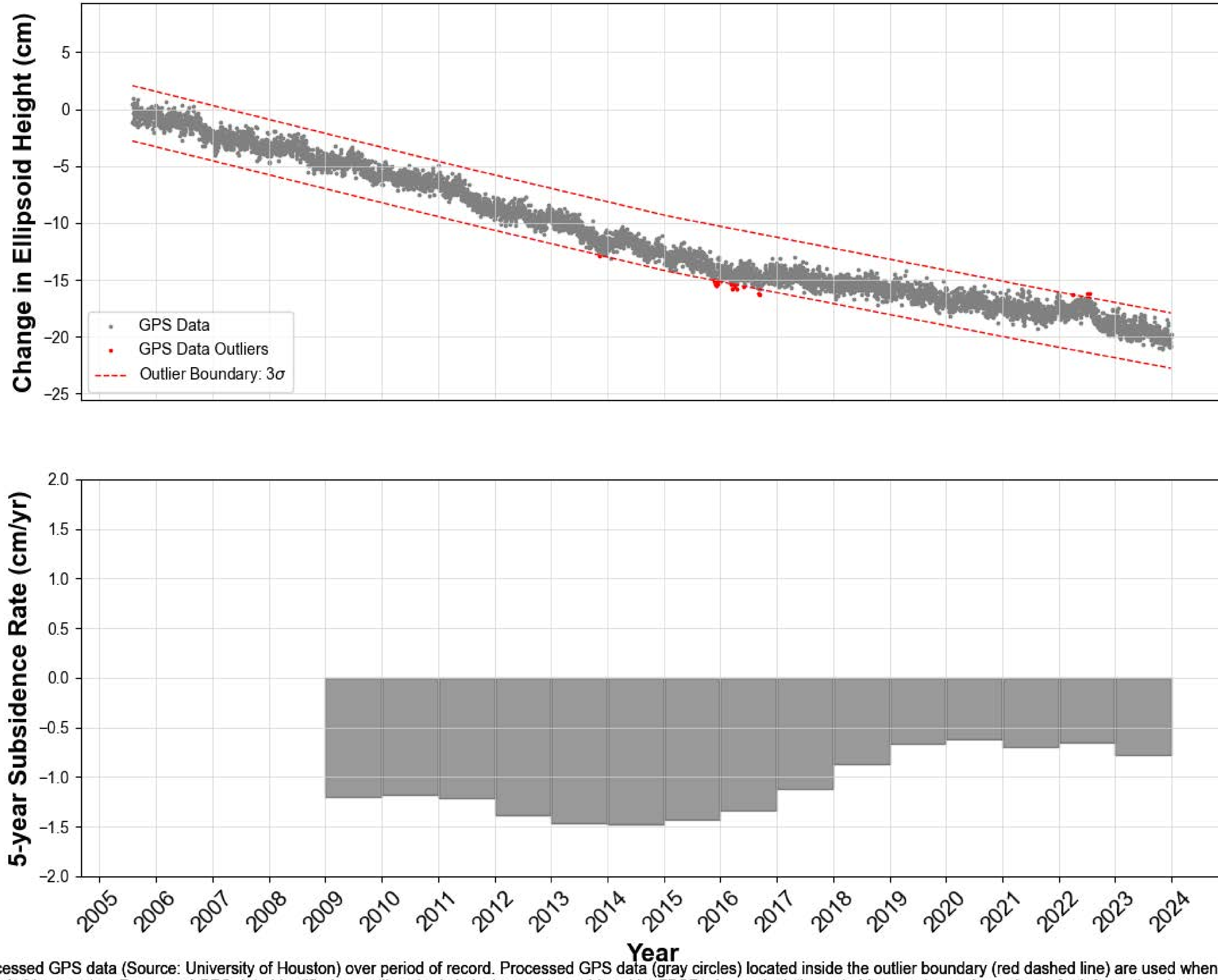
Glidden, TX



Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

TXCN

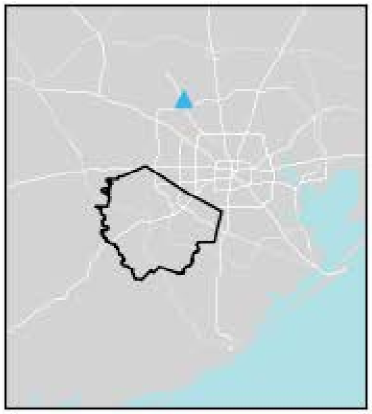
Conroe, TX

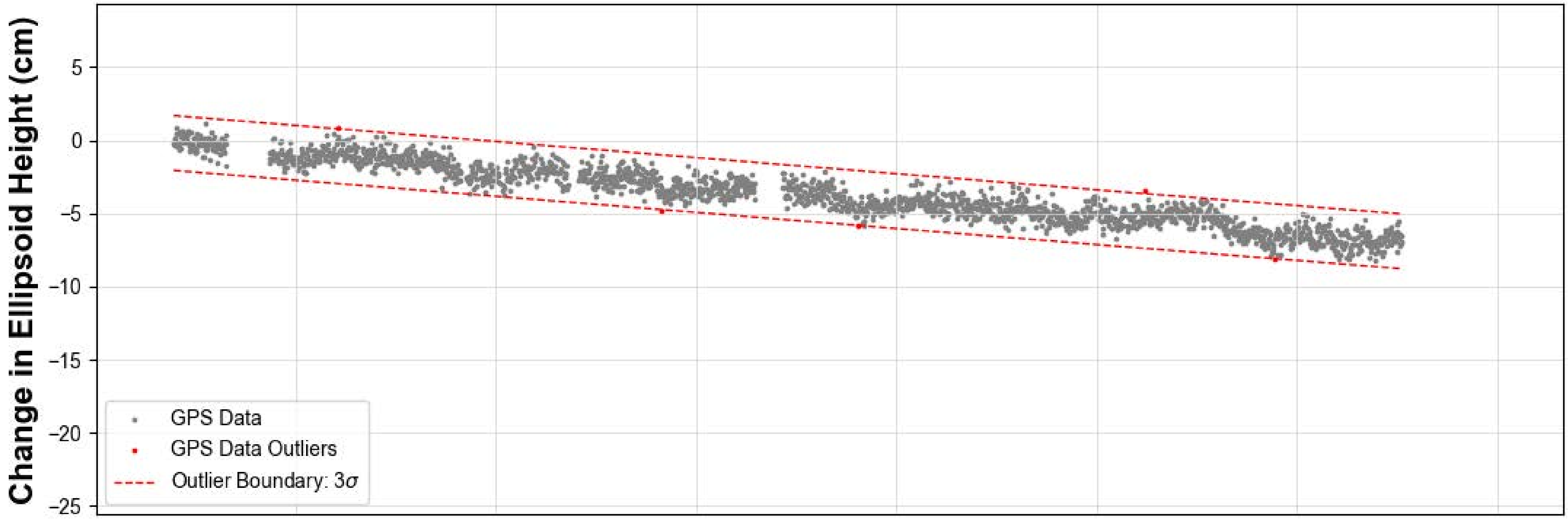


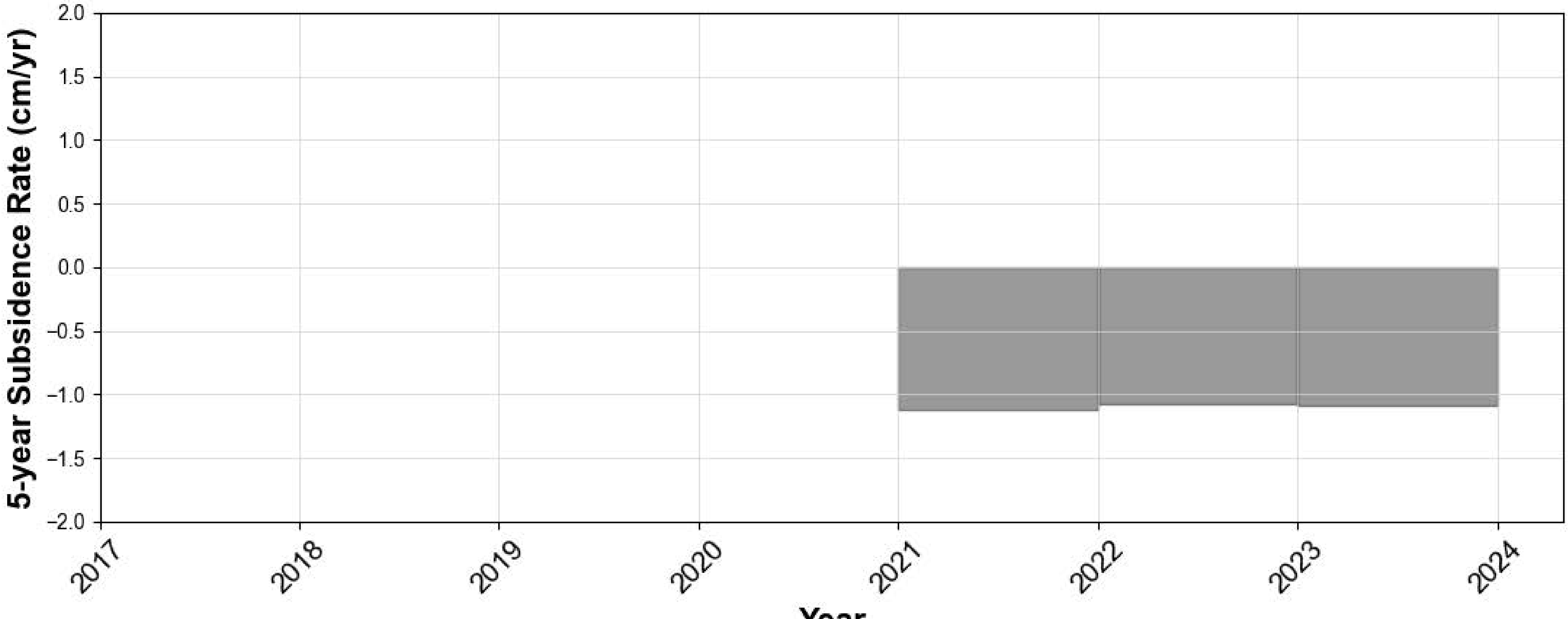
Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

TXCY

Tomball, TX



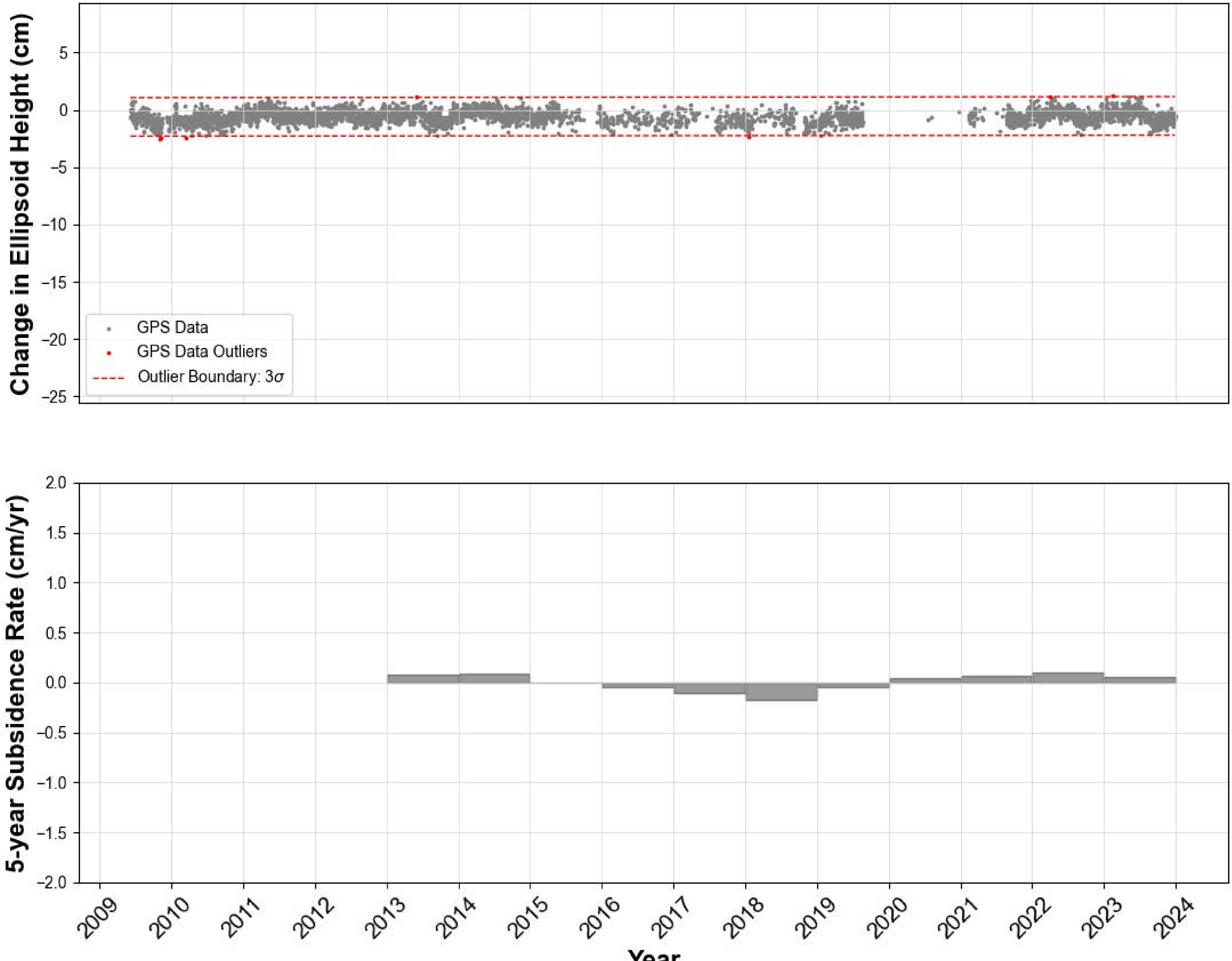




Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

TXED

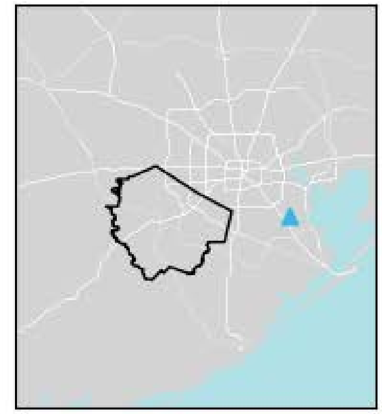
Edna, TX

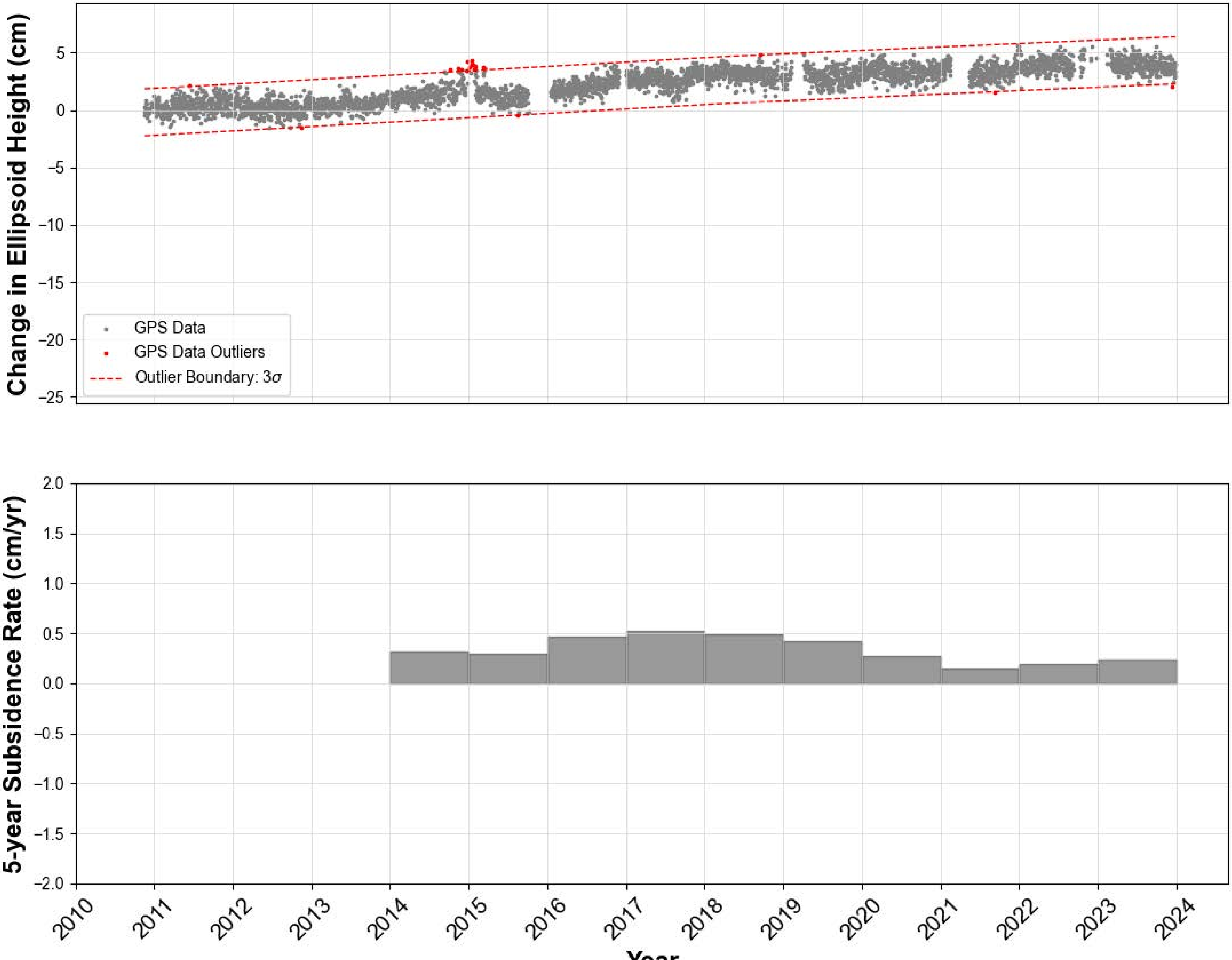


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

TXEX

Houston, TX

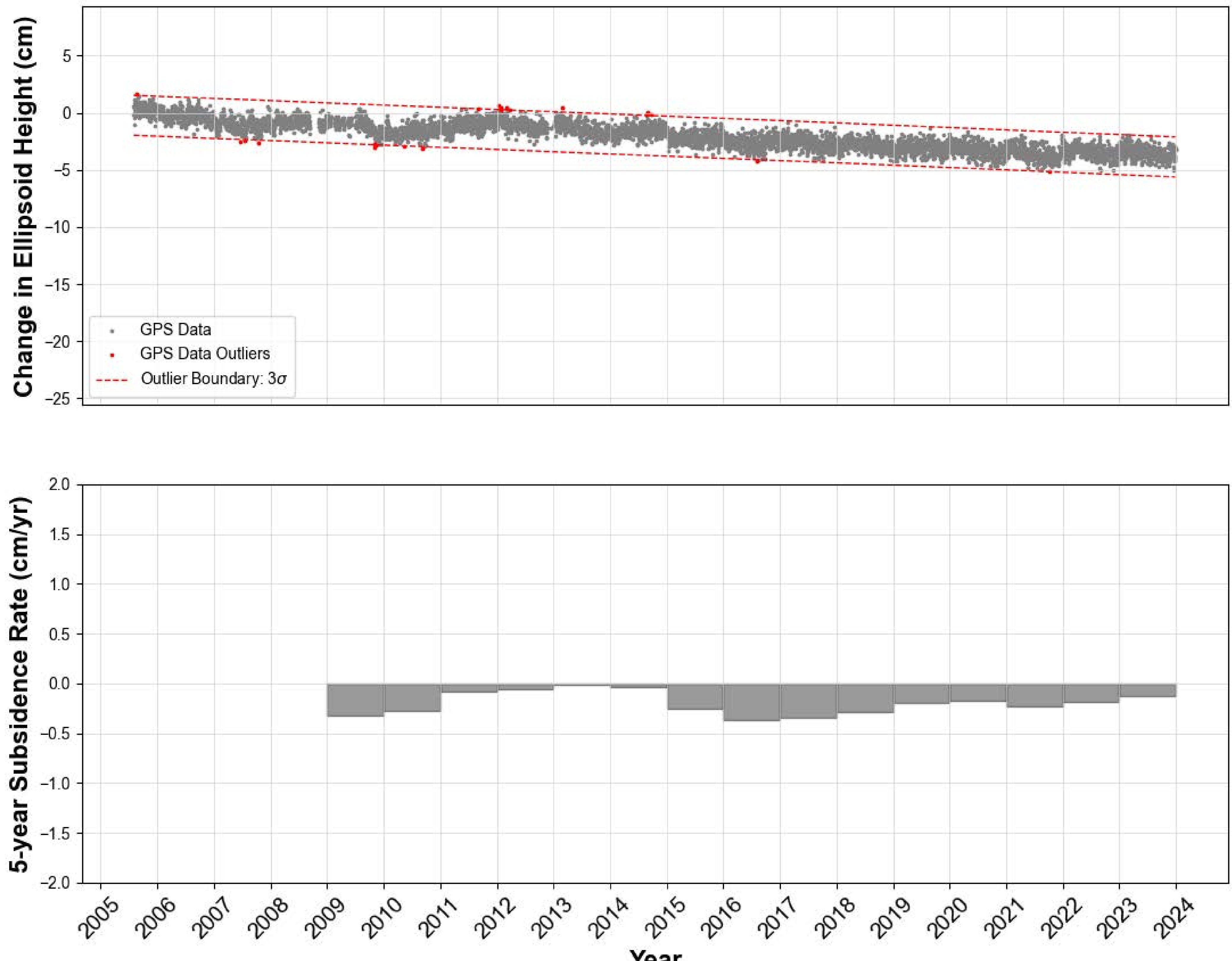




Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

TXGA

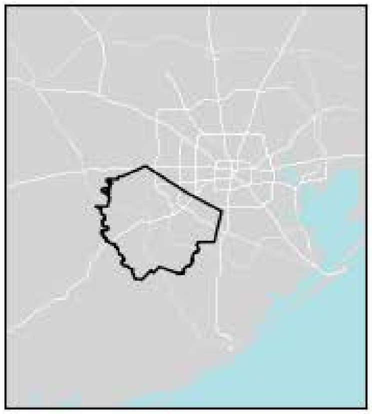
Galveston, TX

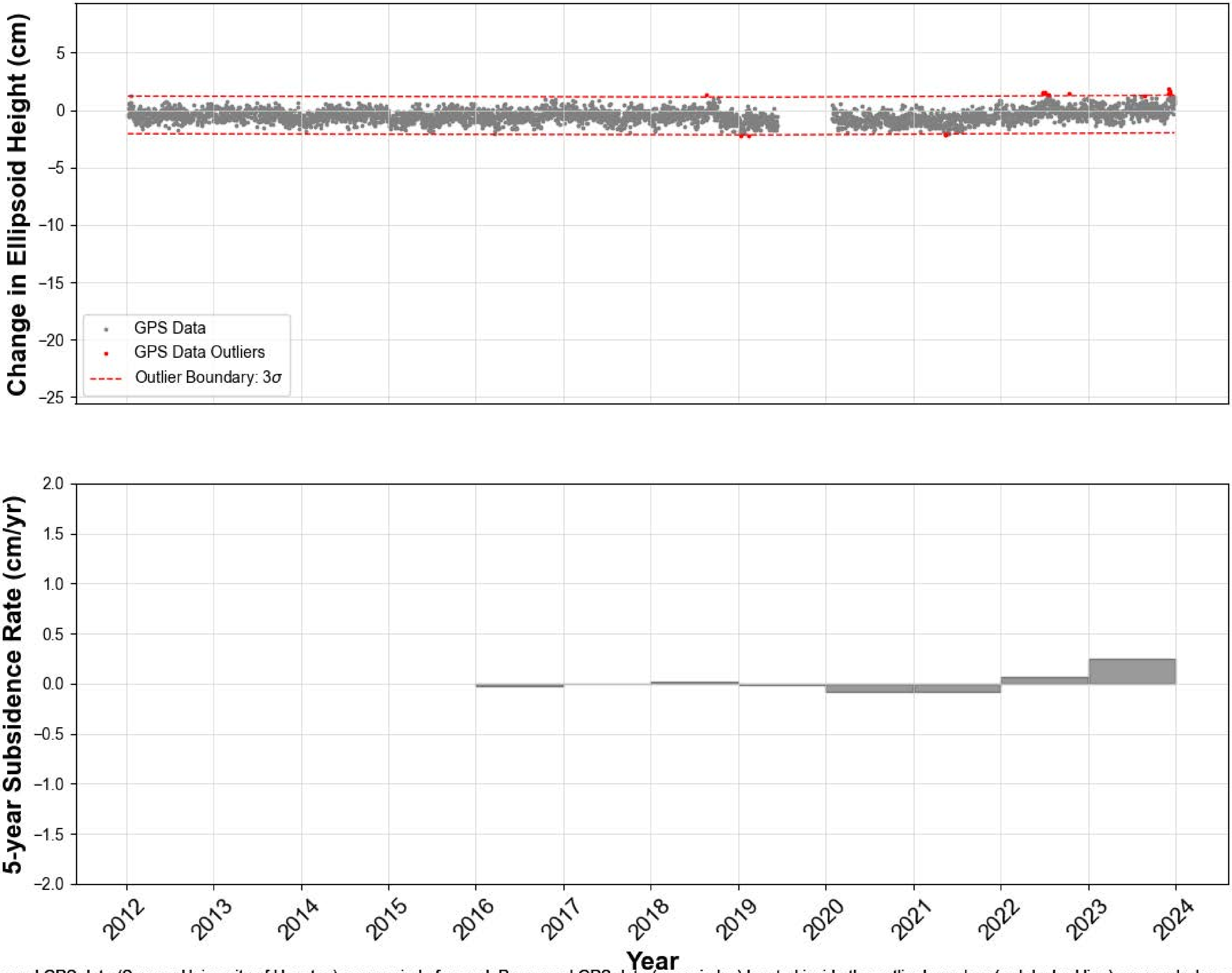


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

TXGN

Groveton, TX

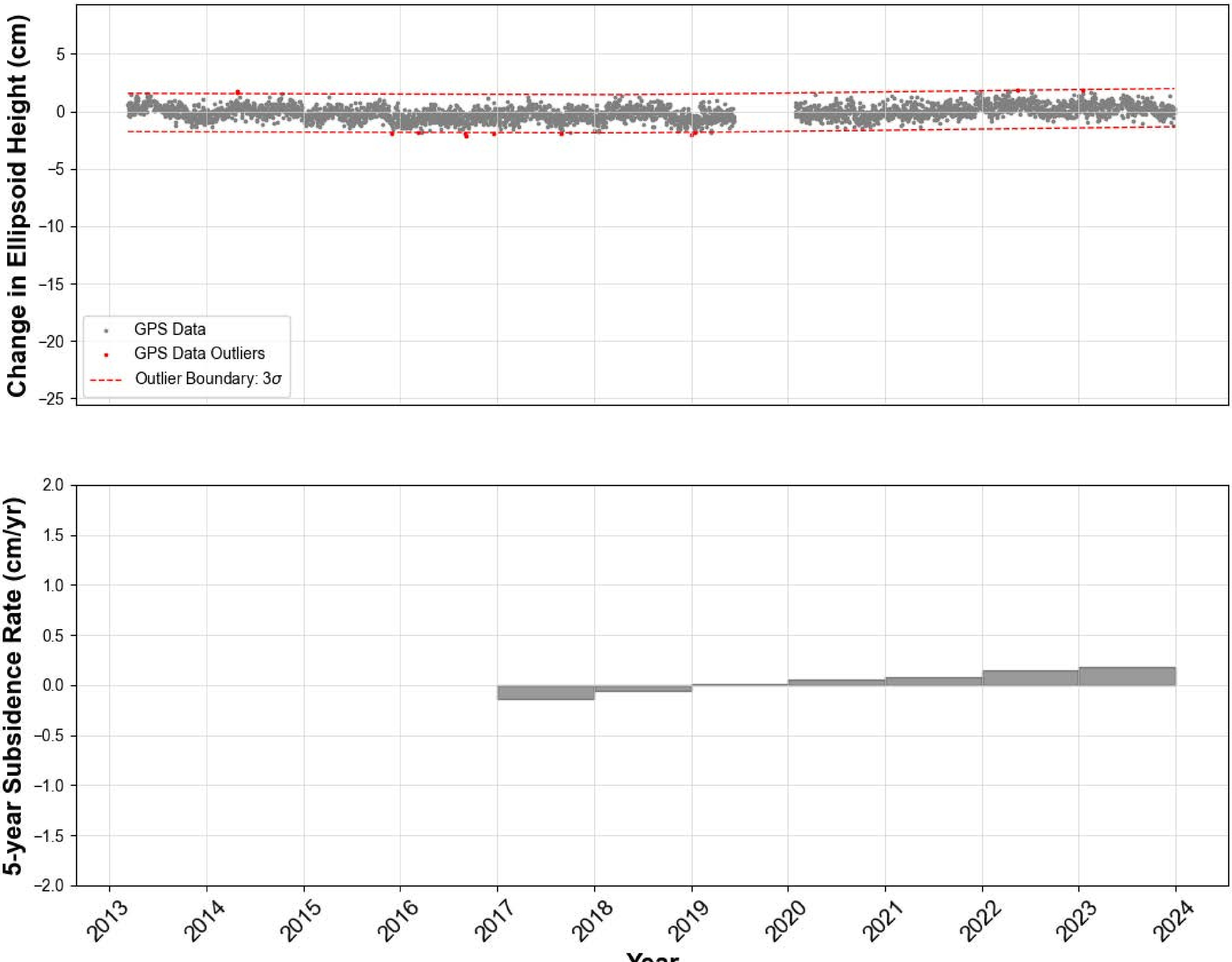




Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

TXH1

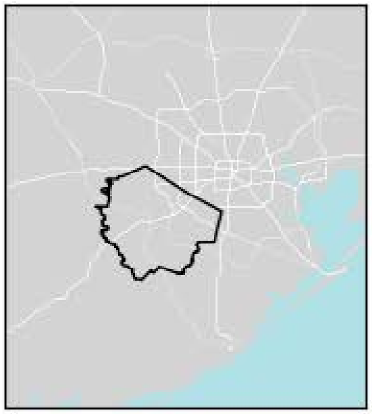
Hearne, TX

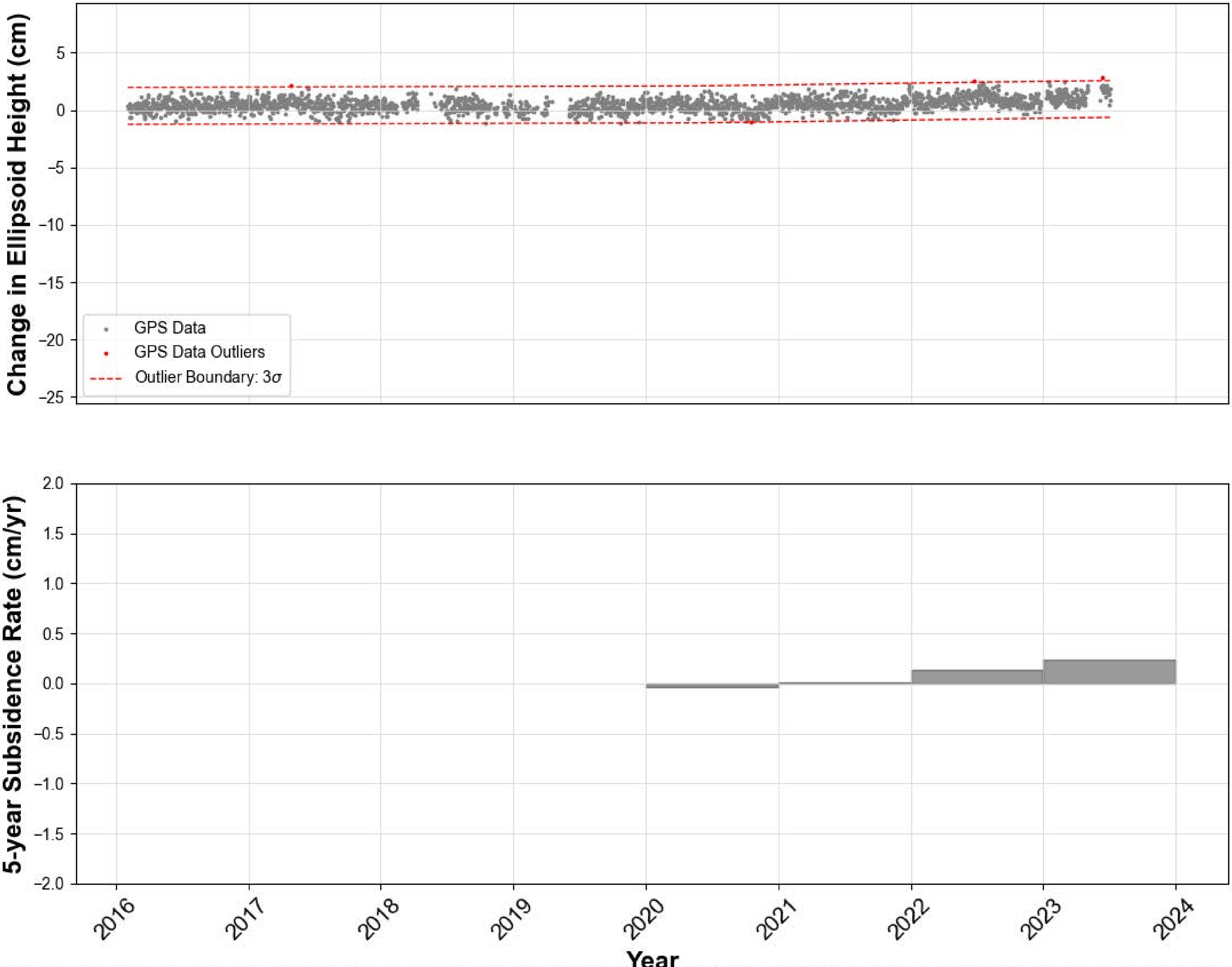


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

TXH2

Bolivar Peninsula, TX

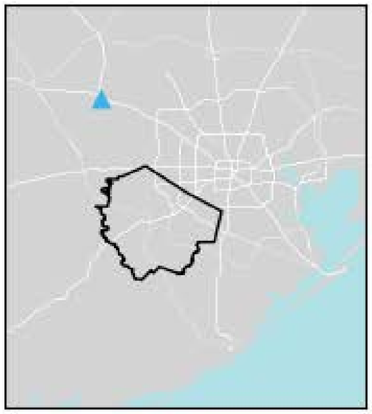


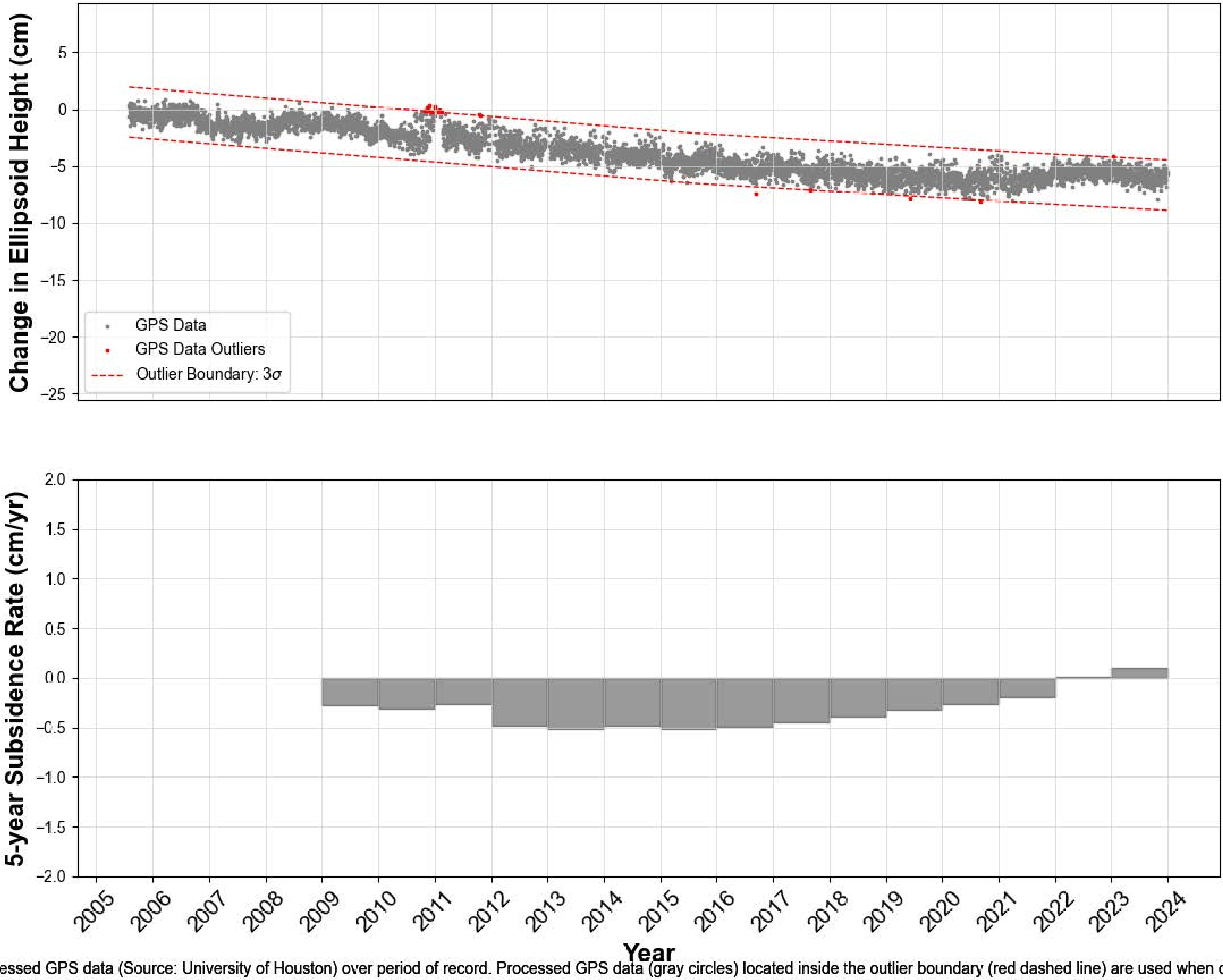


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

TXHE

Hempstead, TX

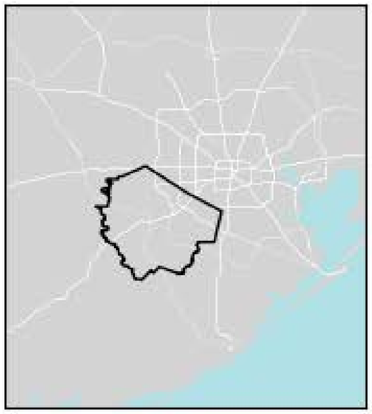


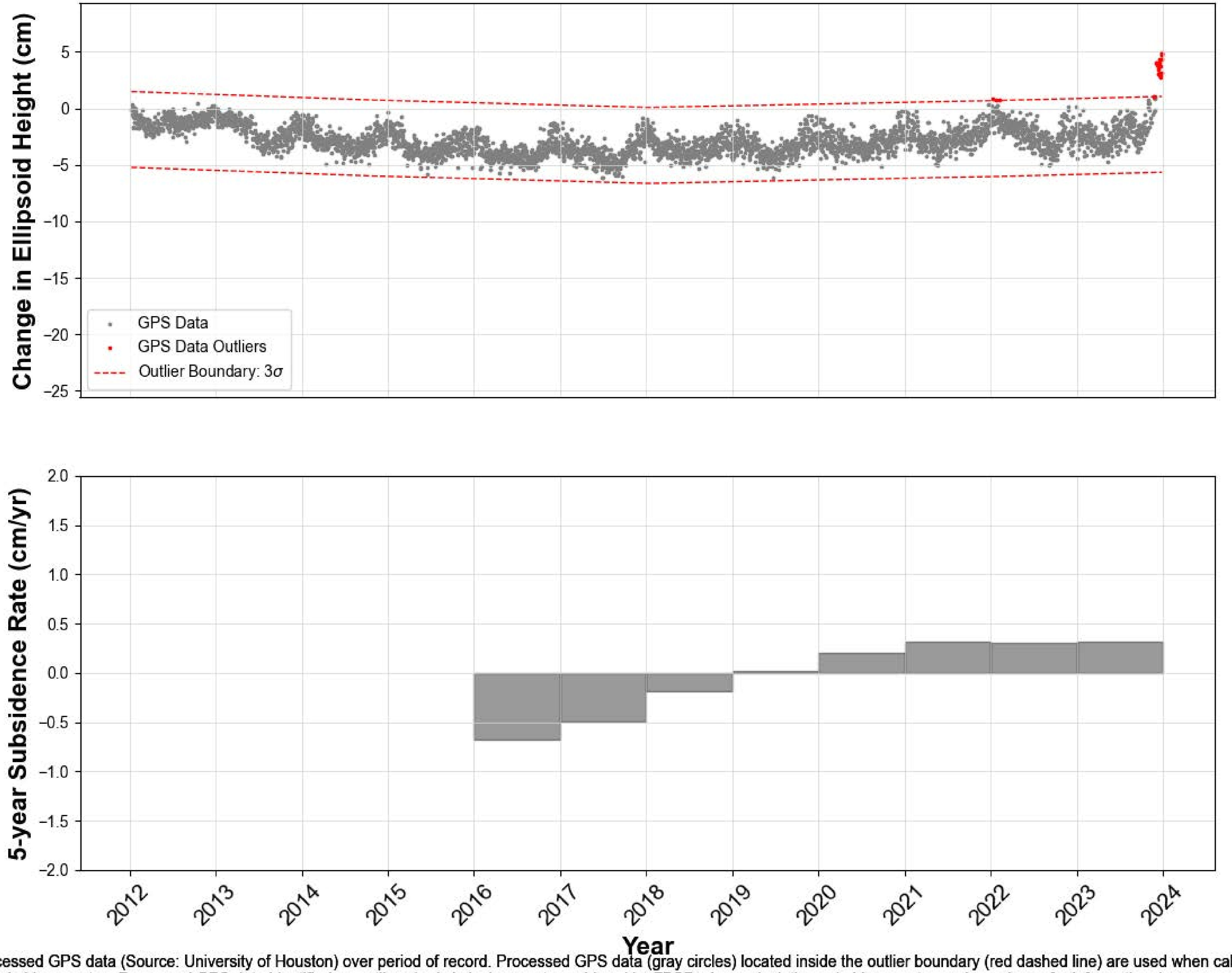


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

TXHP

Hemphill, TX

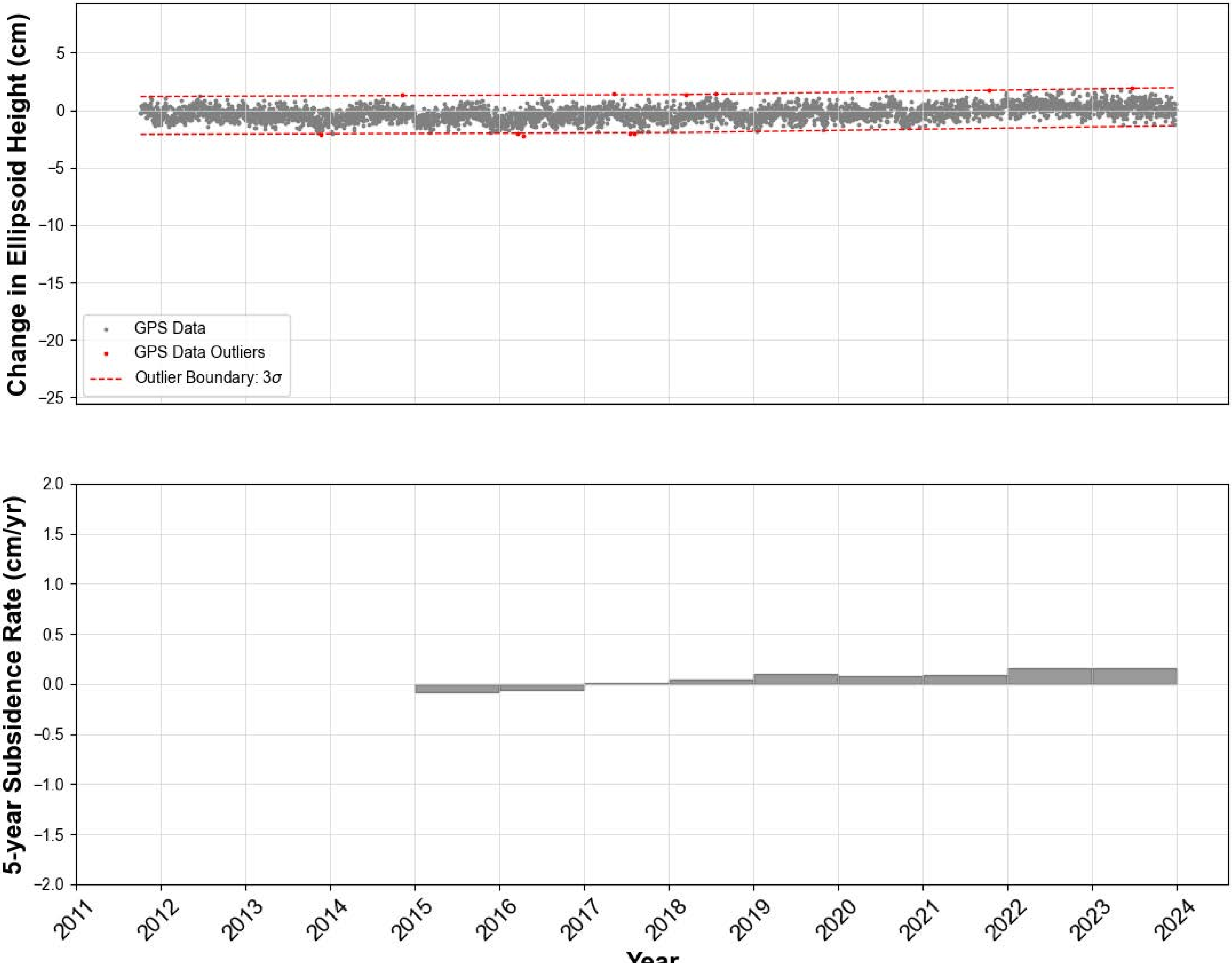




Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

TXKO

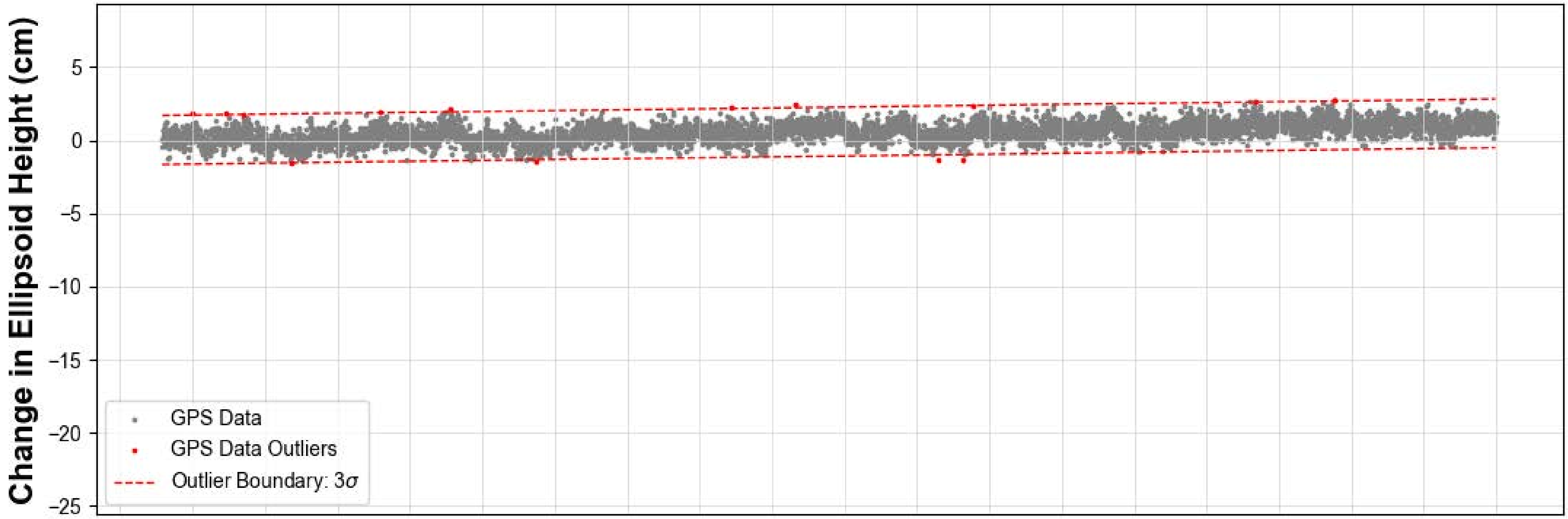
Kountze, TX

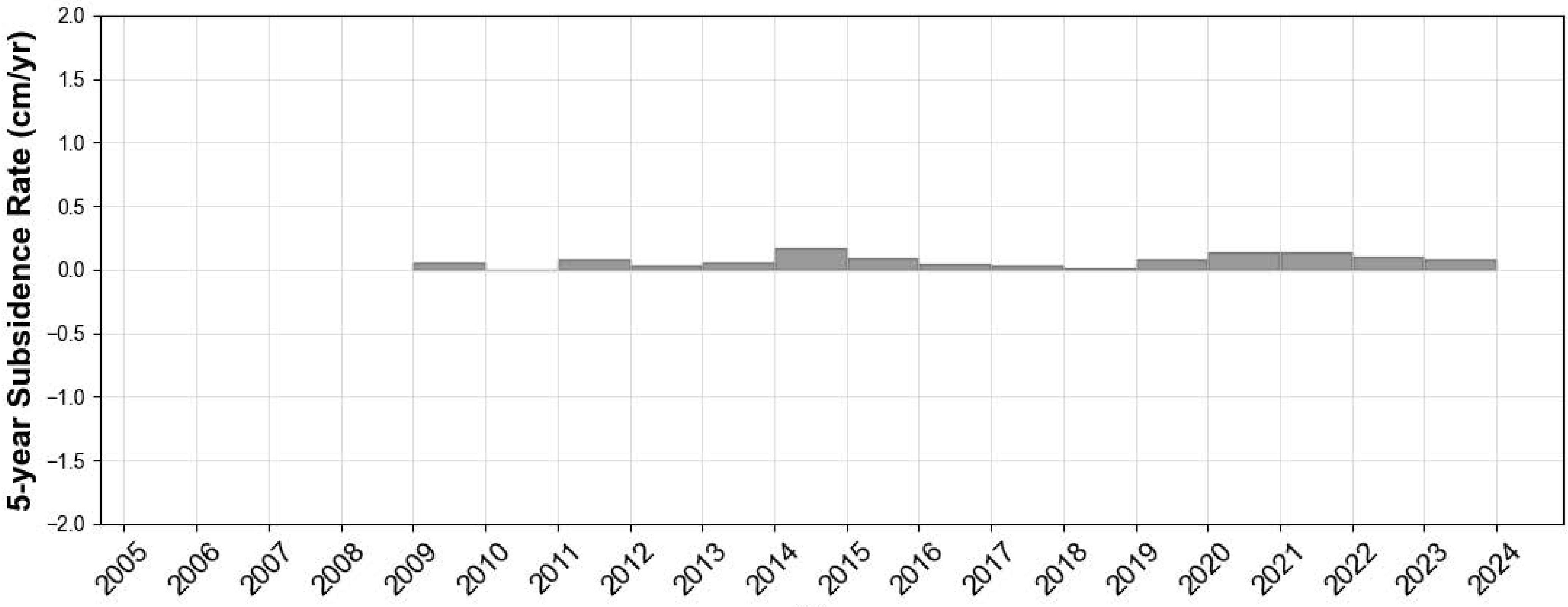


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

TXLF

Lufkin, TX

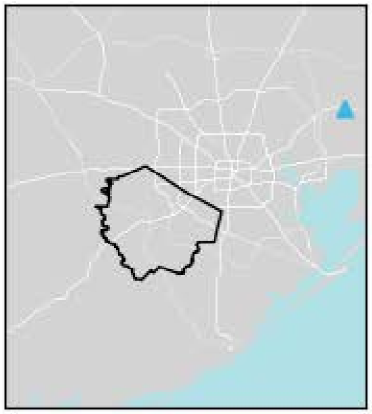


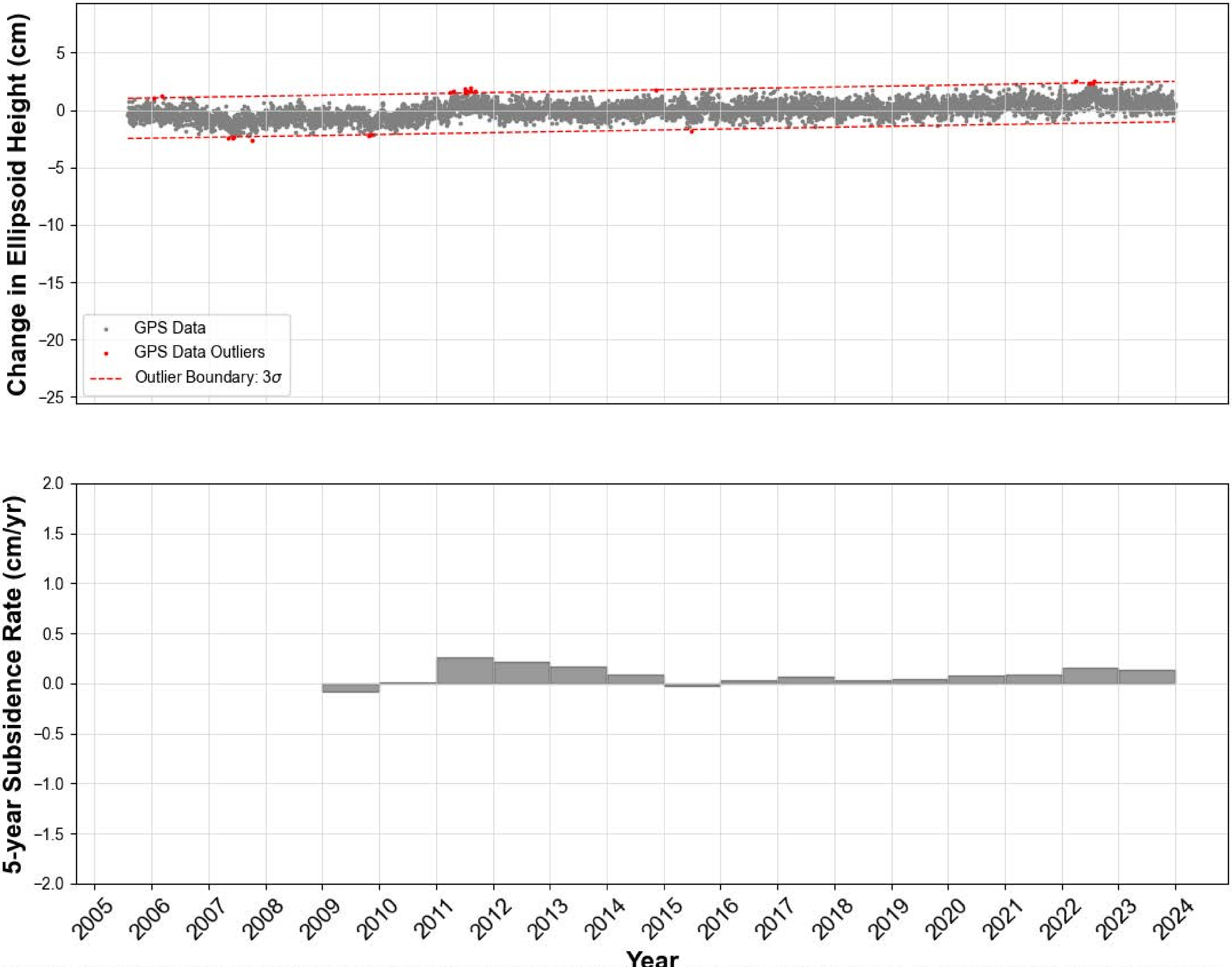


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

TXLI

Dayton, TX

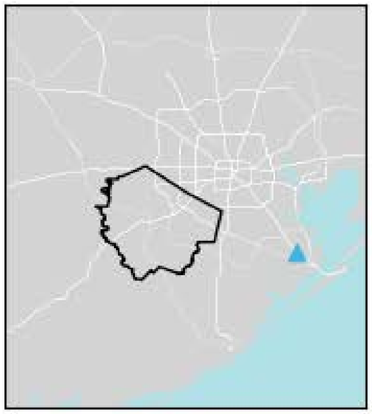


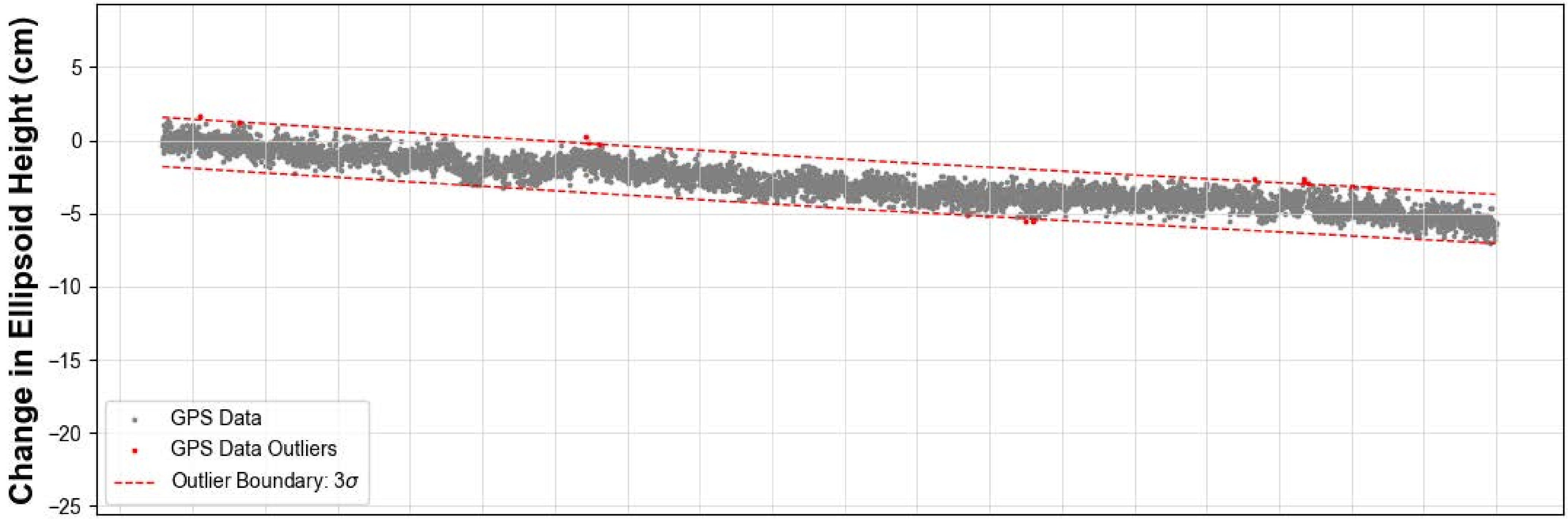


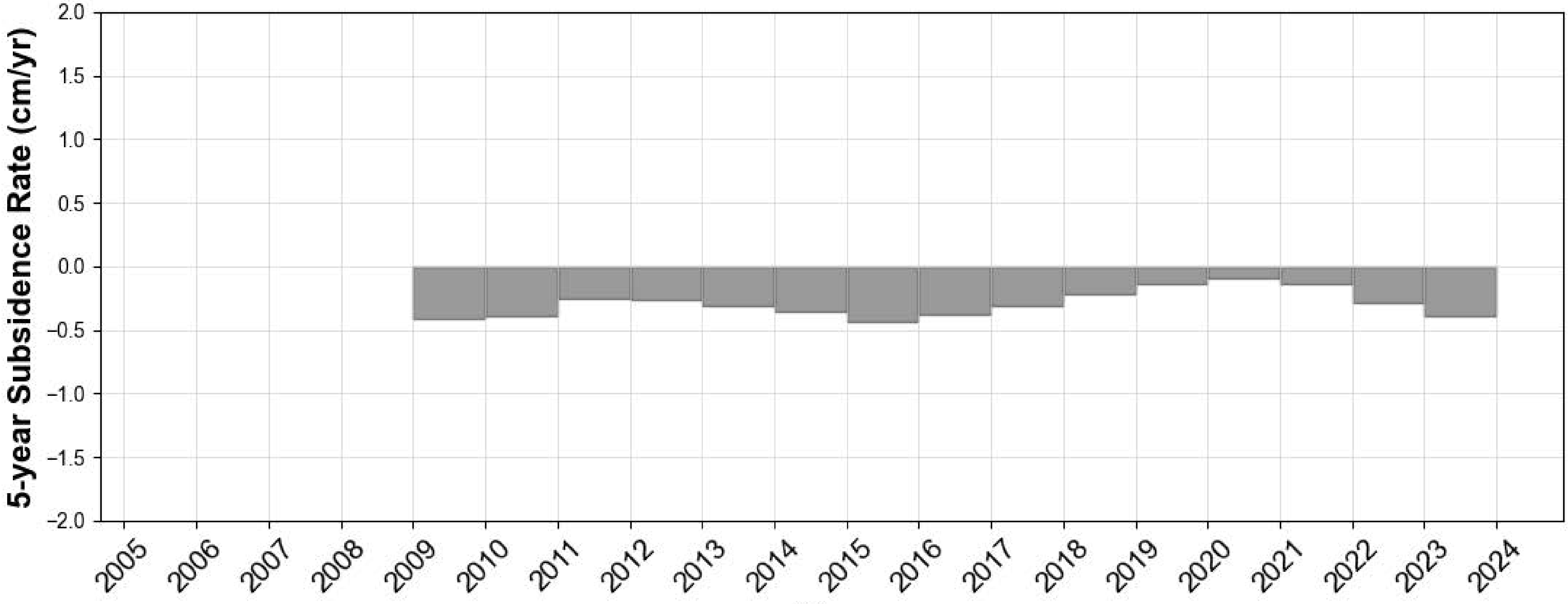
Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

TXLM

La Marque, TX



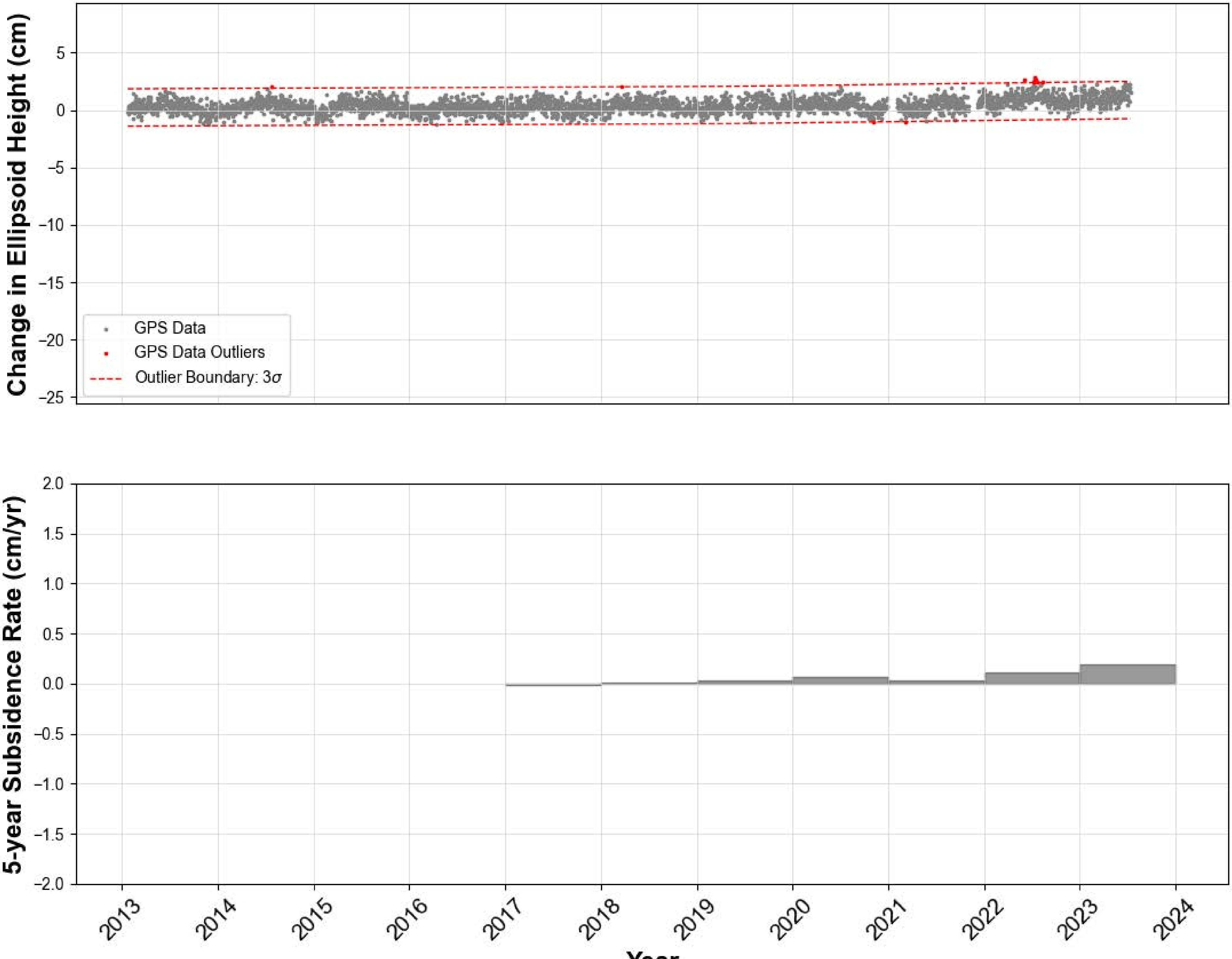




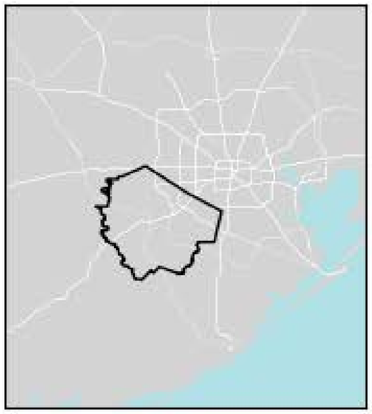
Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

TXLQ

La Marque, TX

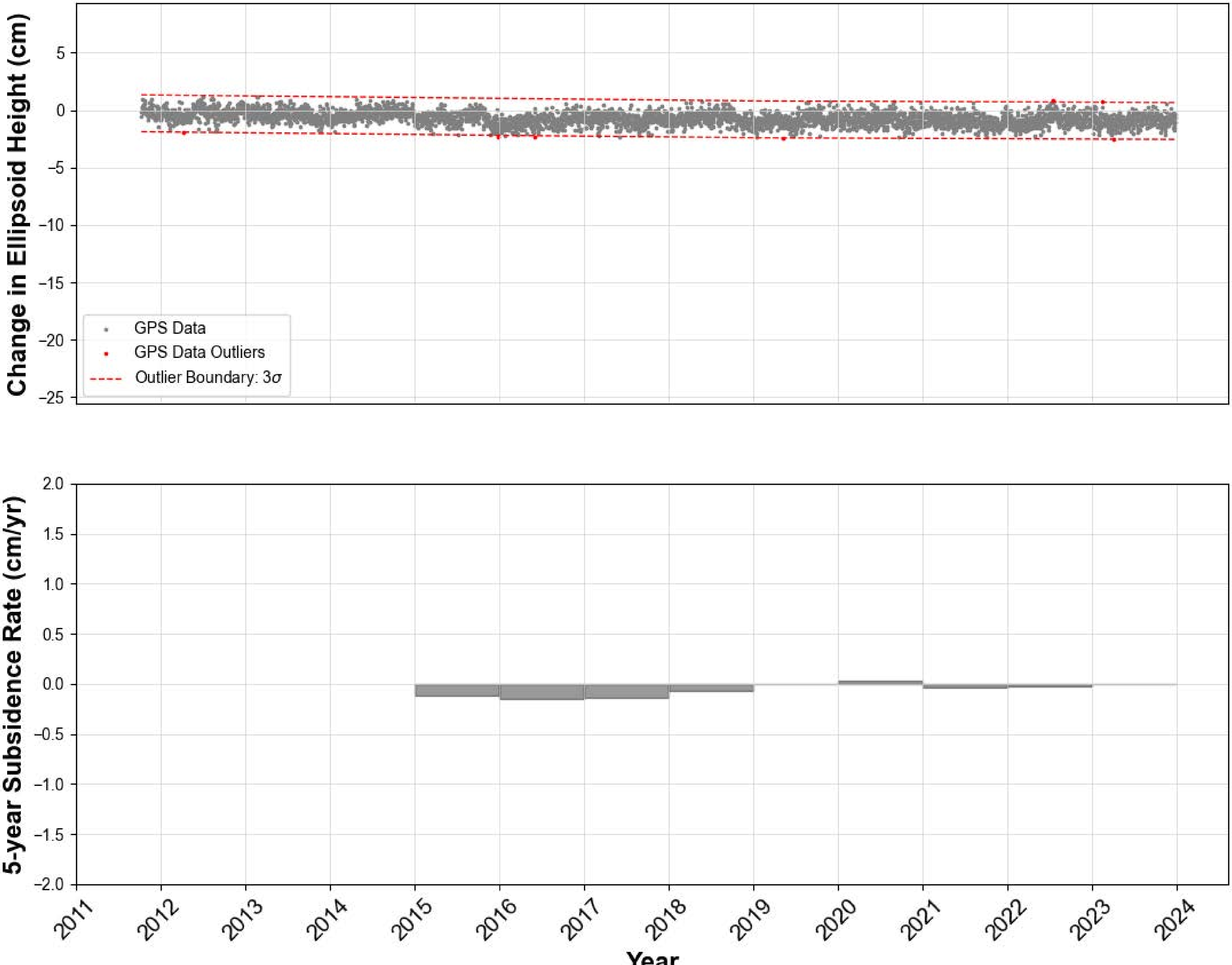


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.



TXLV

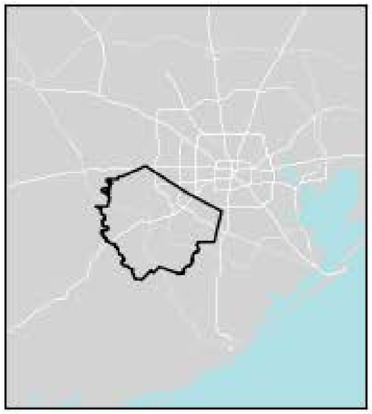
Livingston, TX

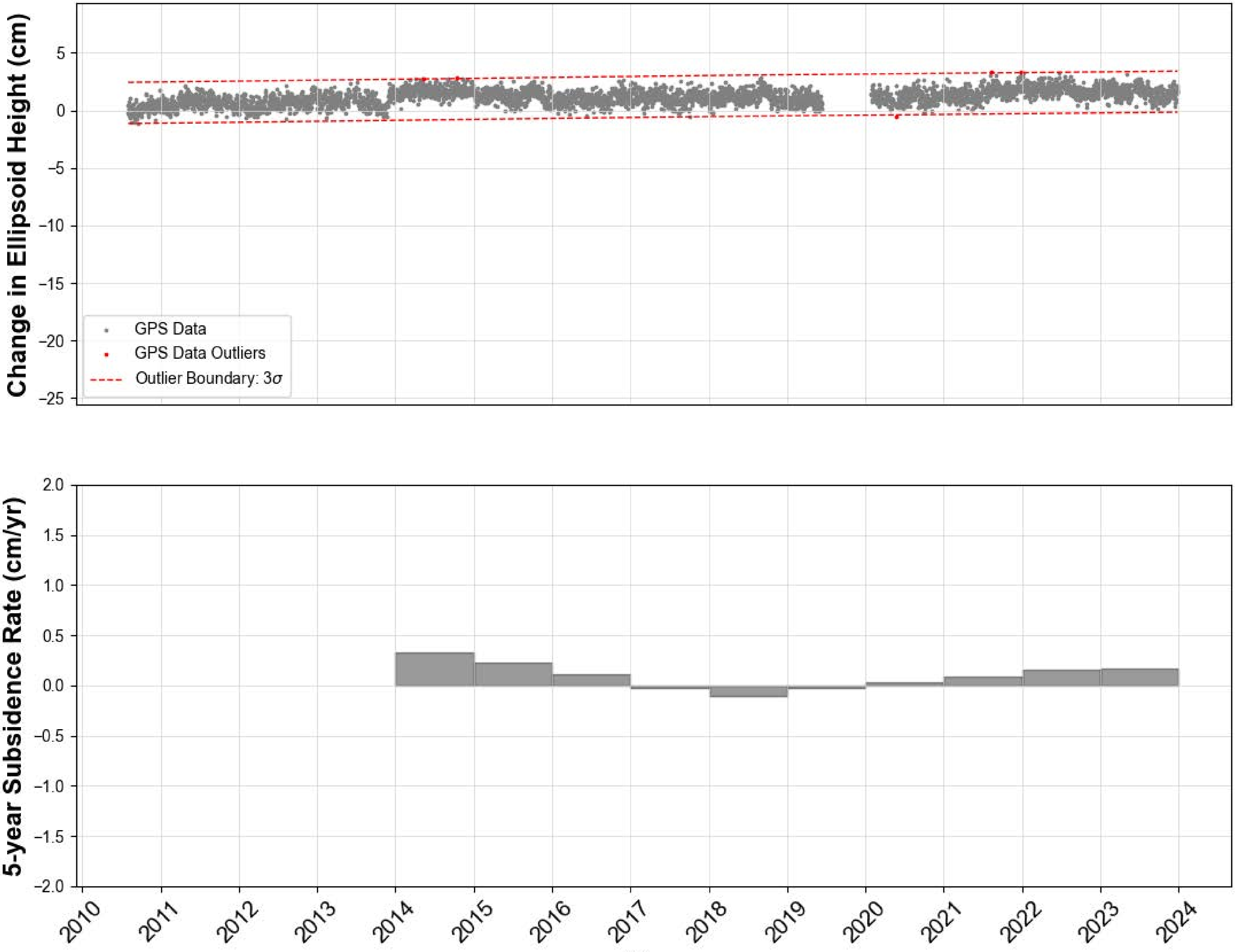


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

TXMD

Madisonville, TX

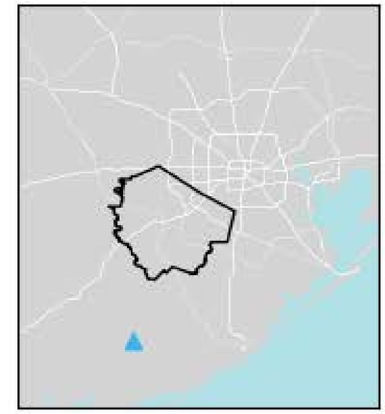


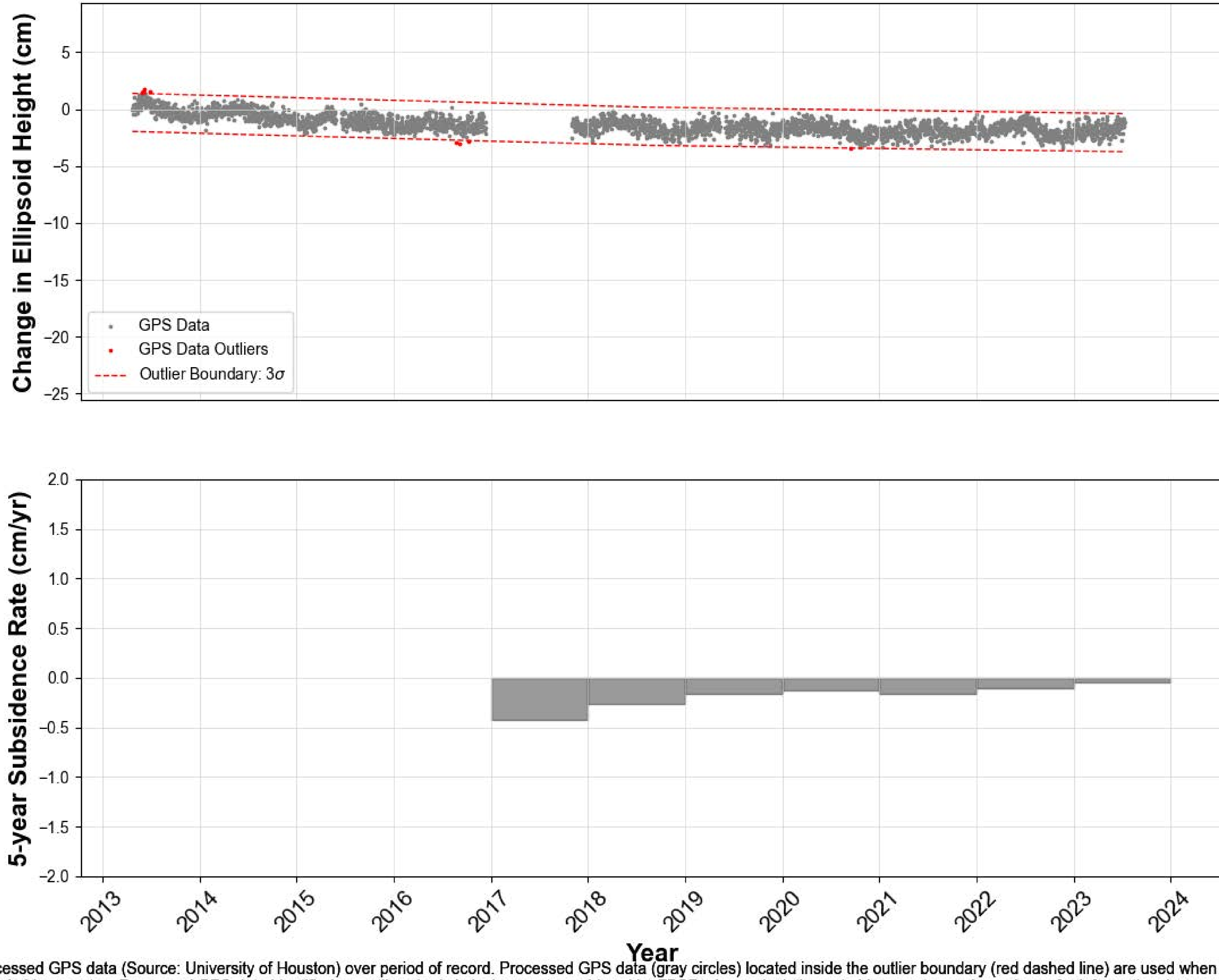


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

TXMG

Bay City, TX

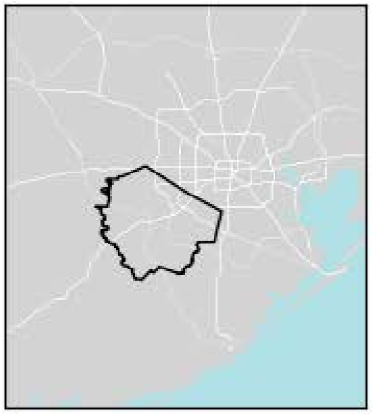


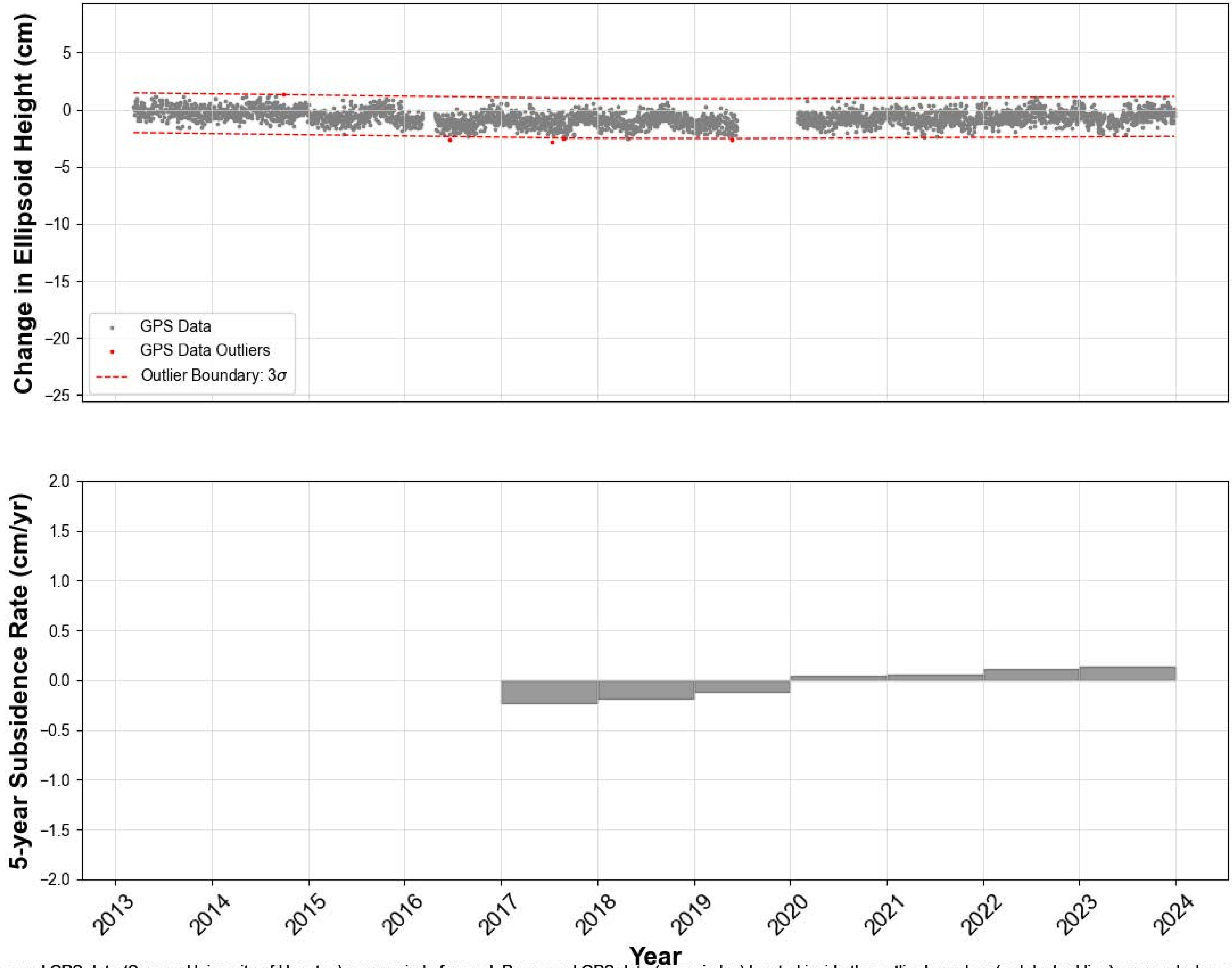


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

TXNE

Newton, TX

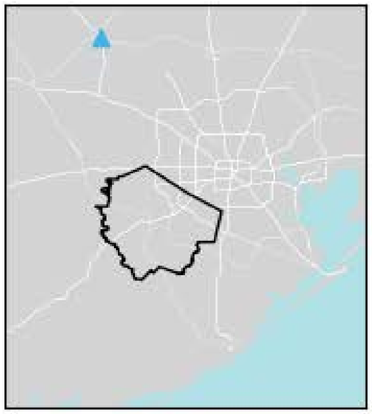


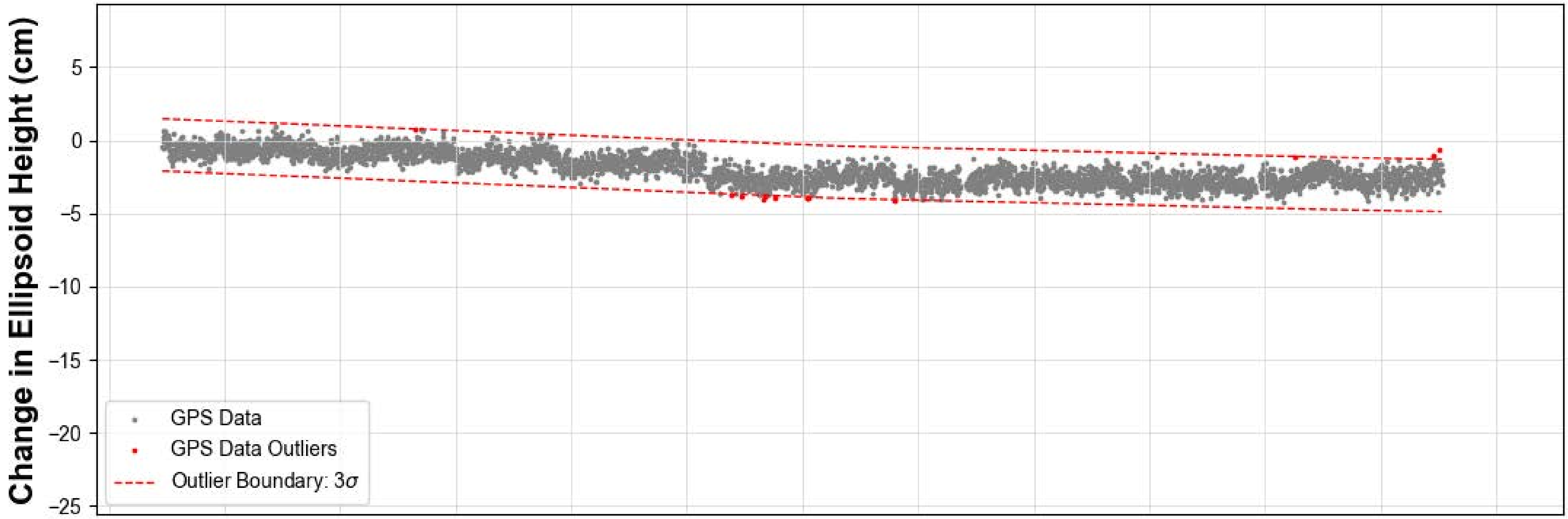


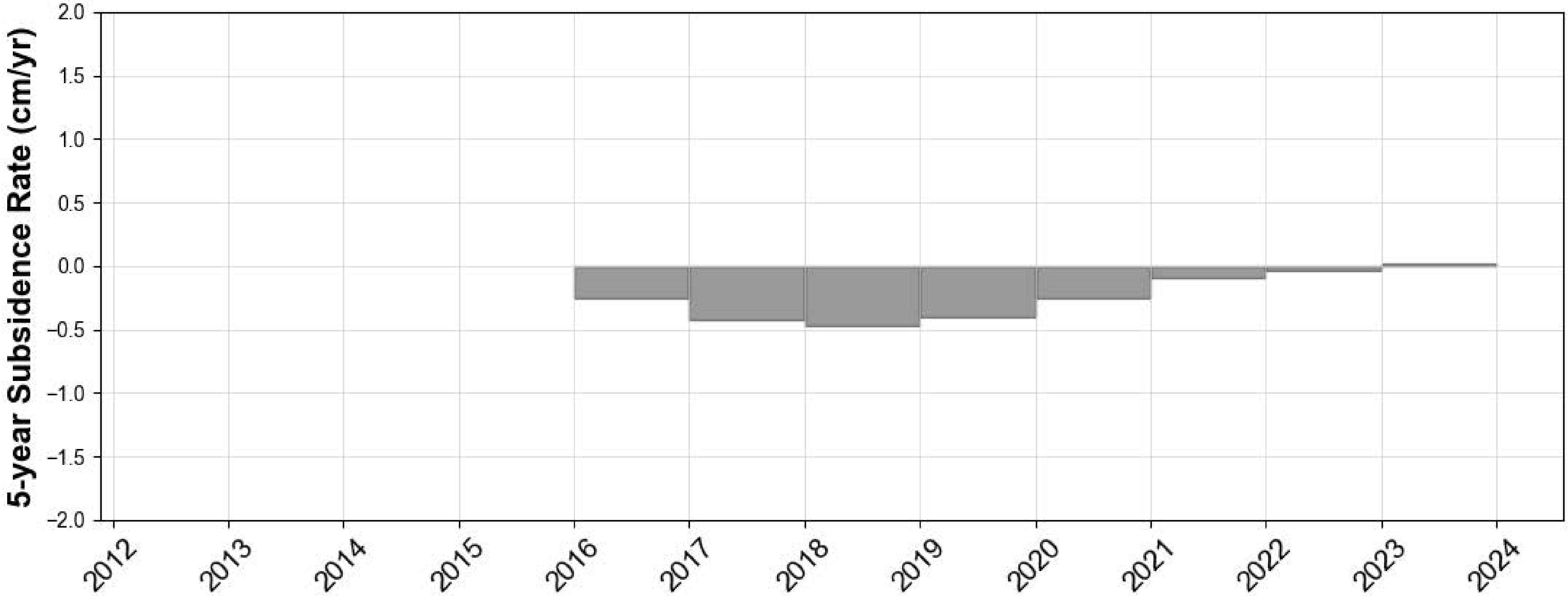
Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

TXNV

Navasota, TX



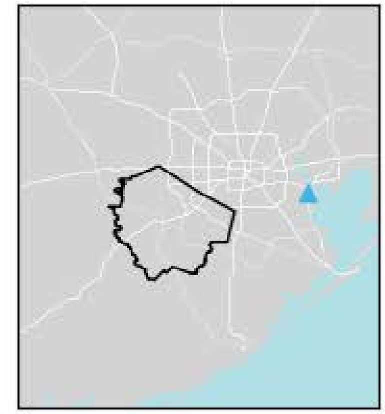


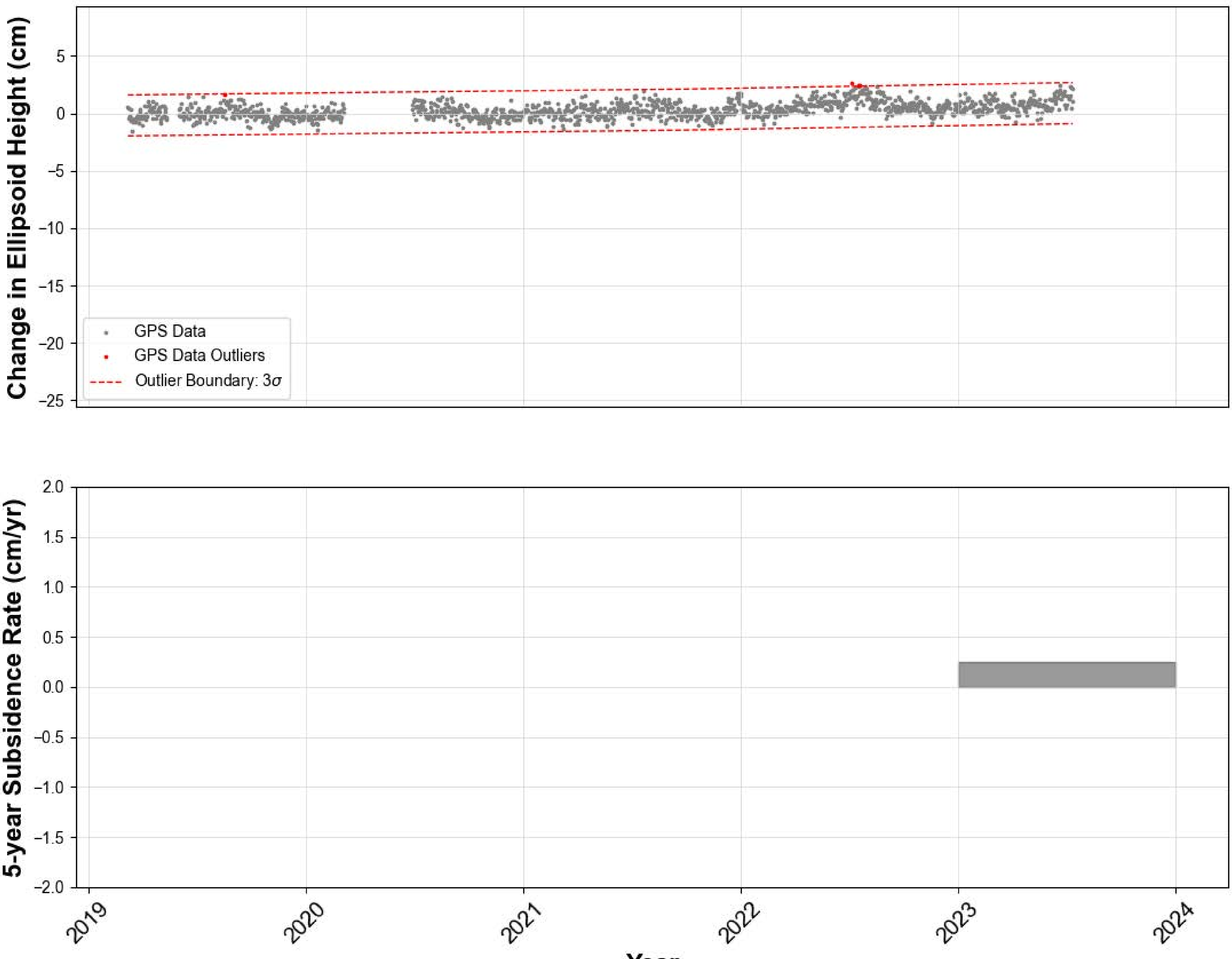


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

TXP5

La Porte, TX

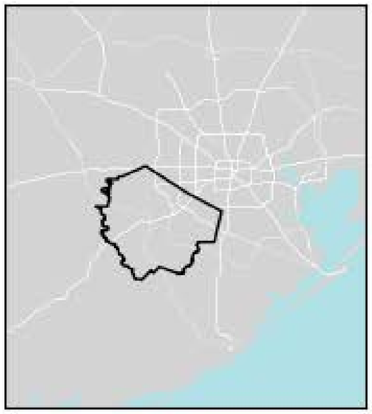


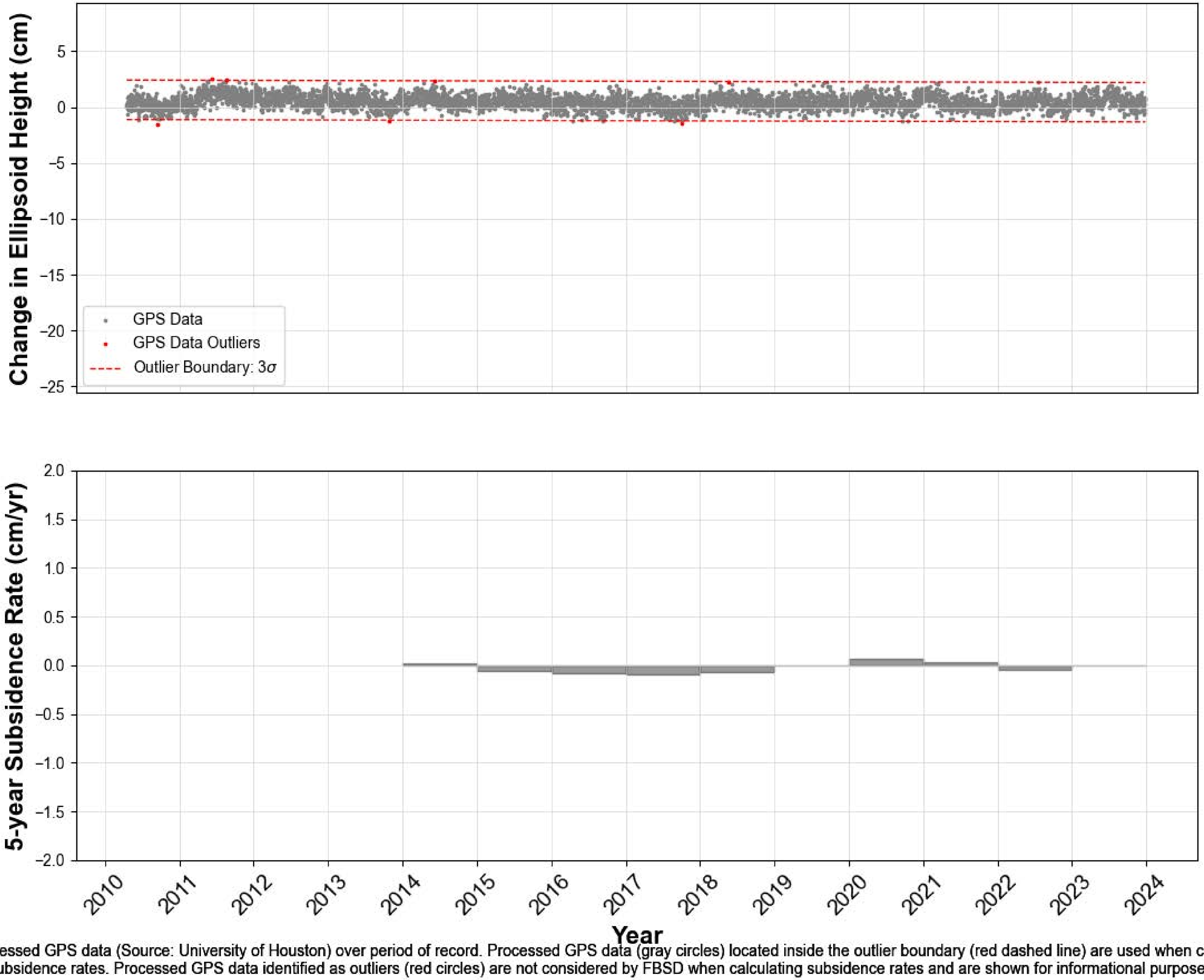


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

TXPV

Port Lavaca, TX

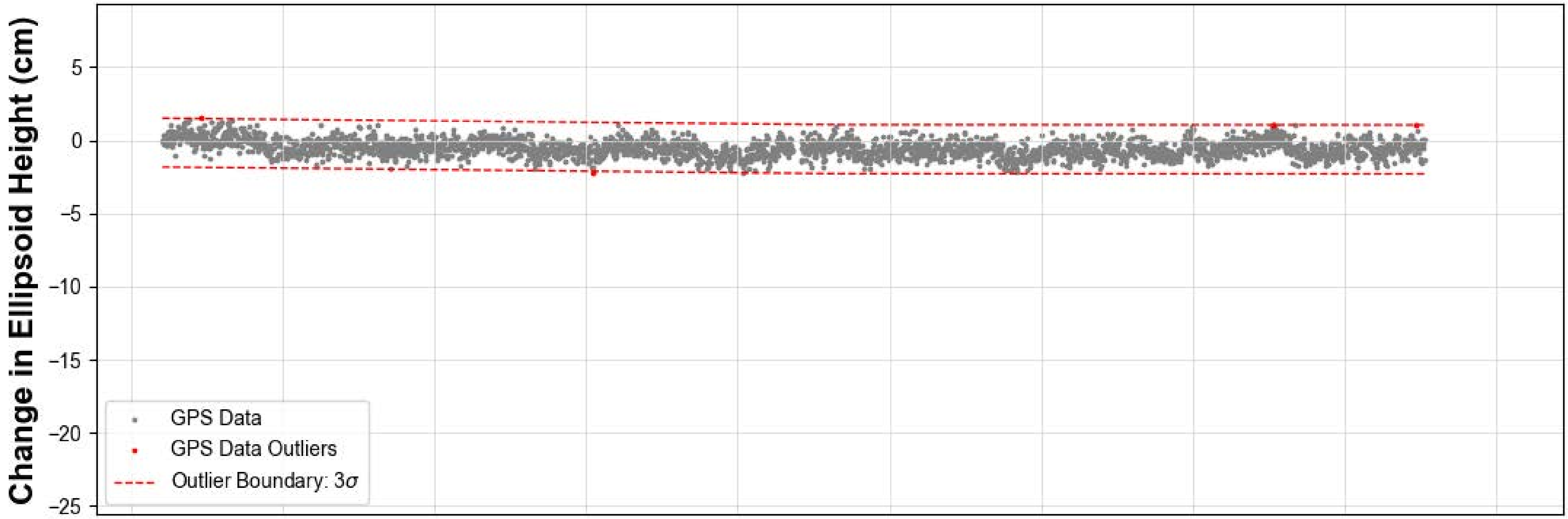


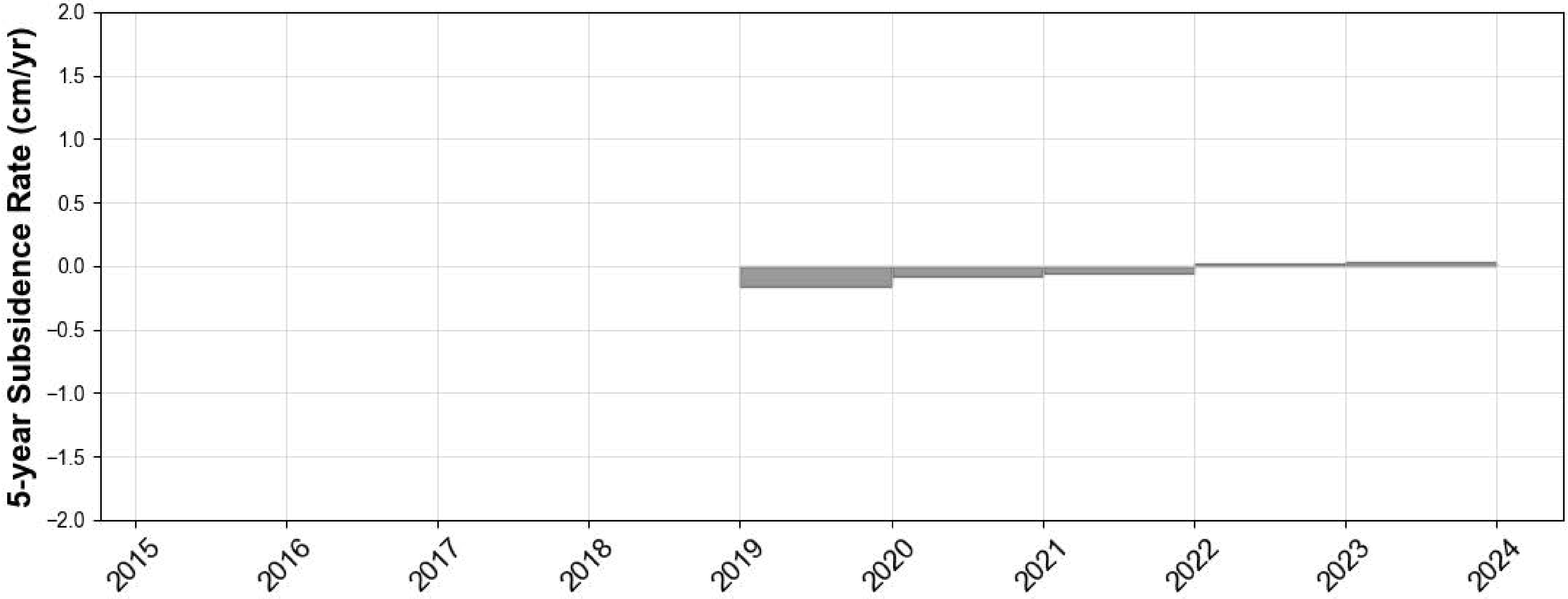


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

TXRN

Rosenberg, TX

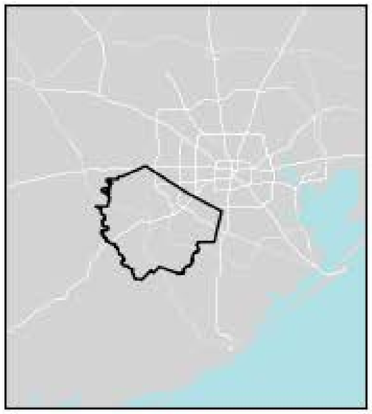


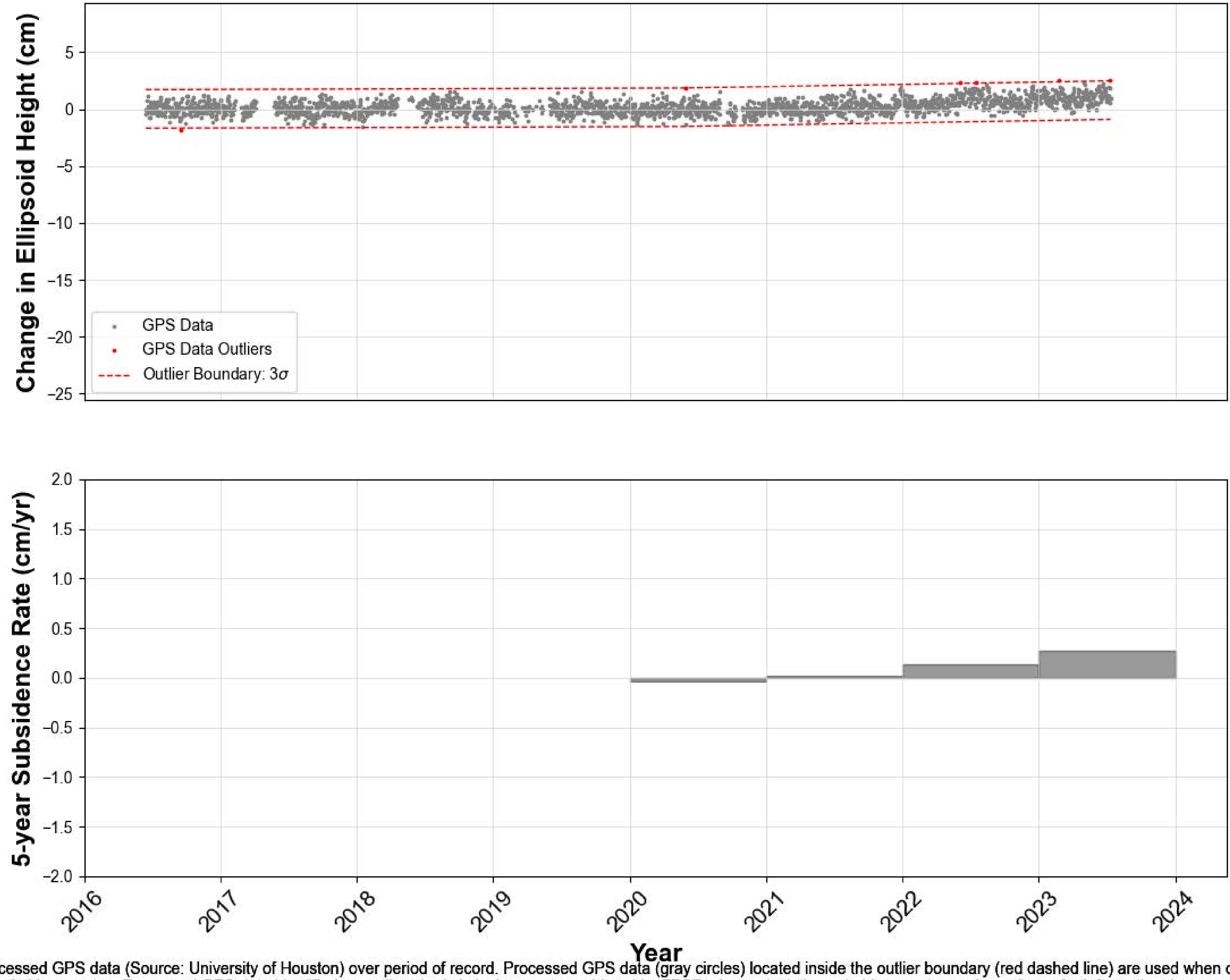


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

TXSP

Port Arthur, TX

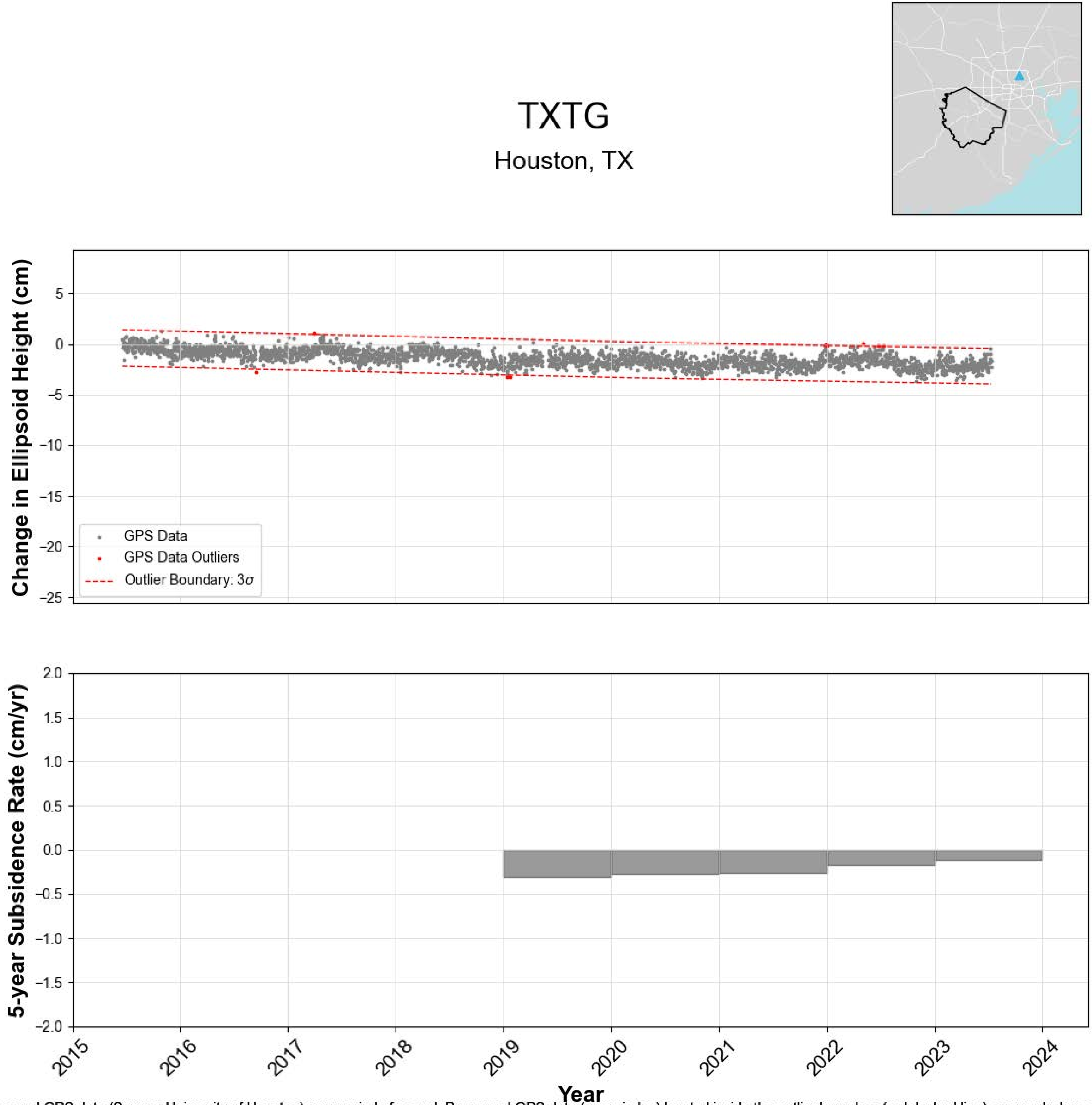




Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

TXTG

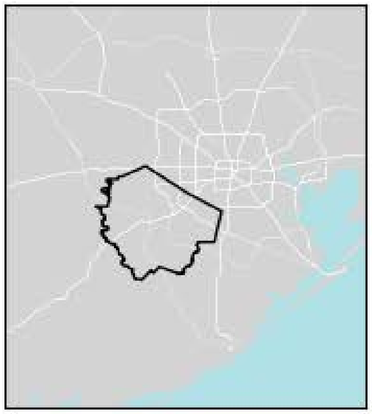
Houston, TX

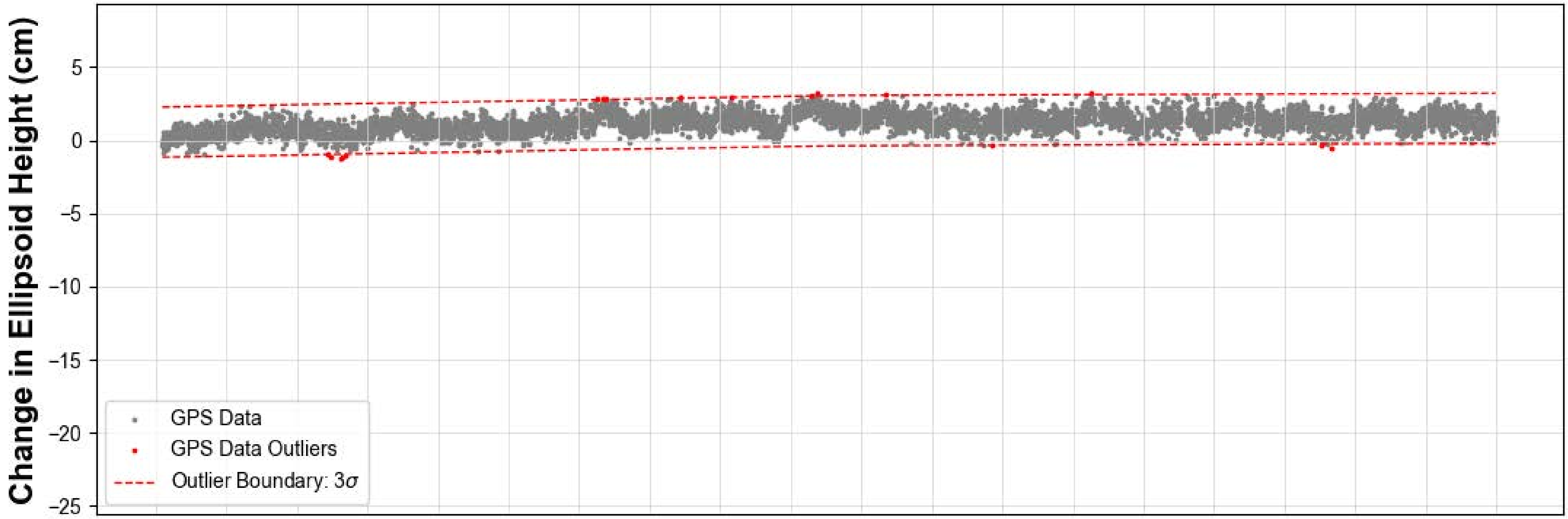


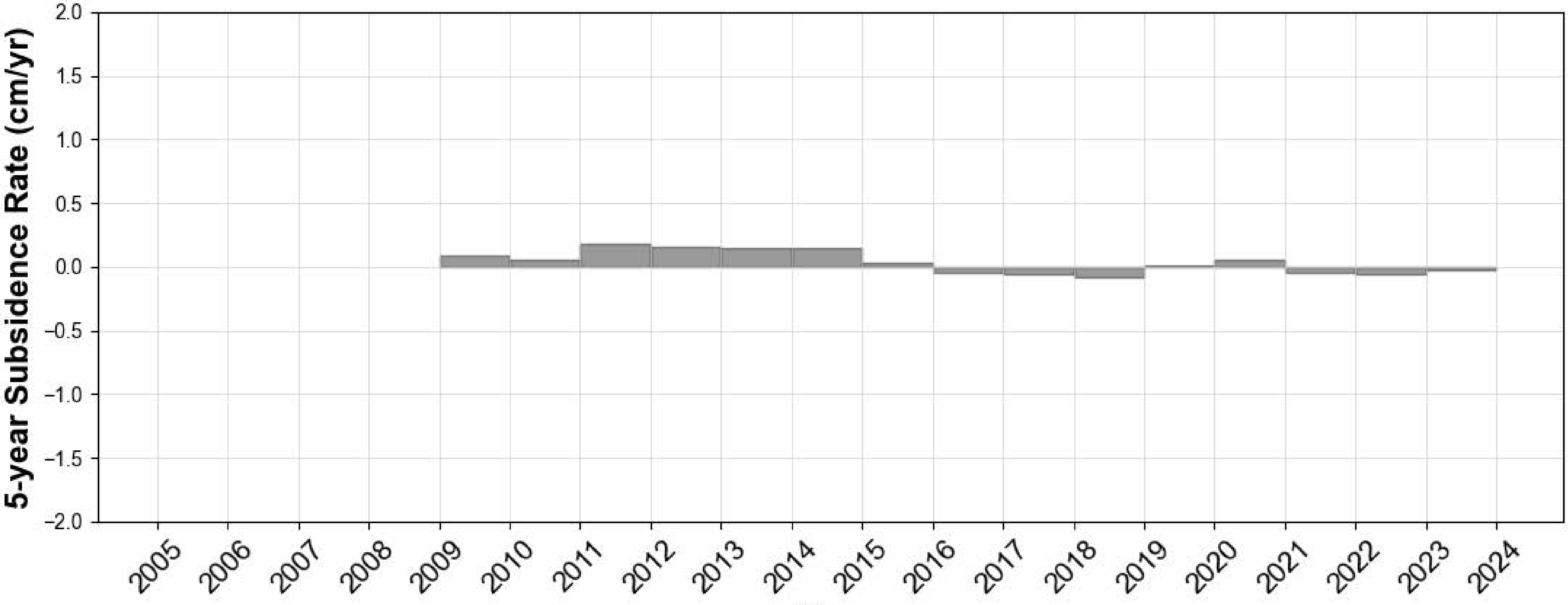
Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

TXVA

Victoria, TX



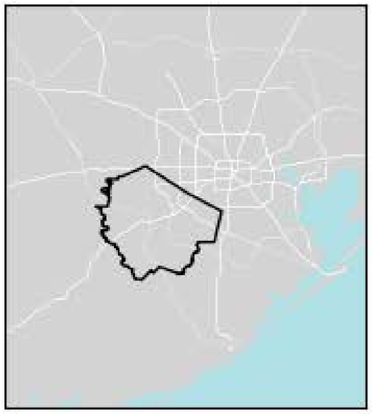


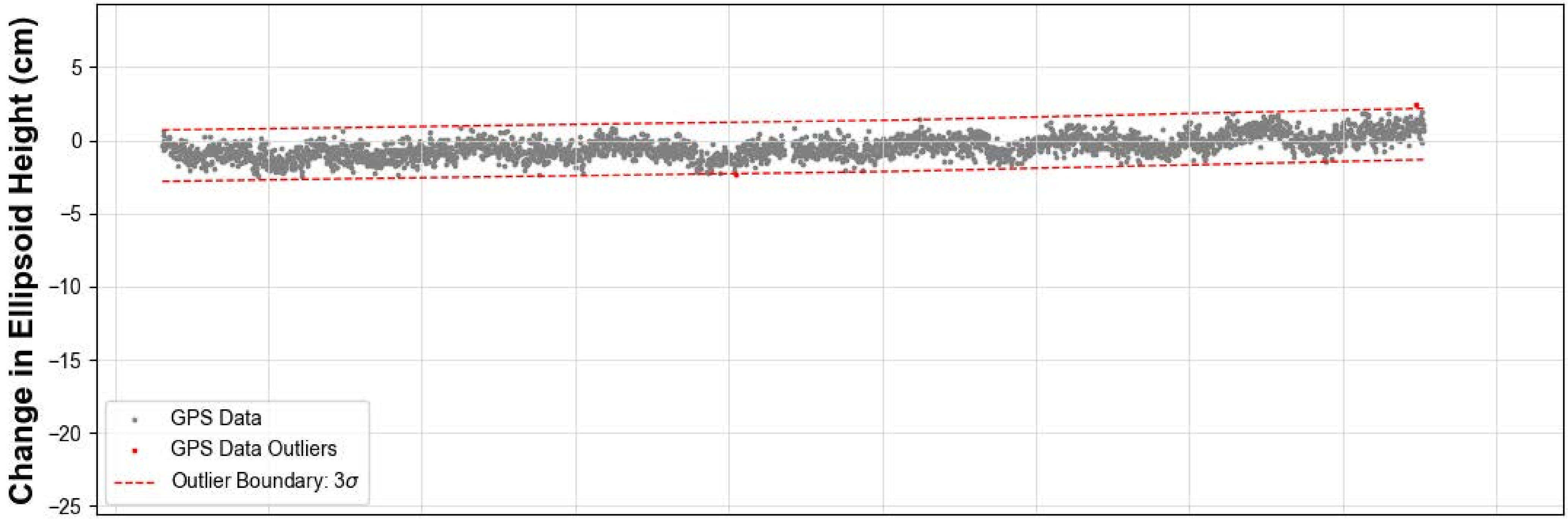


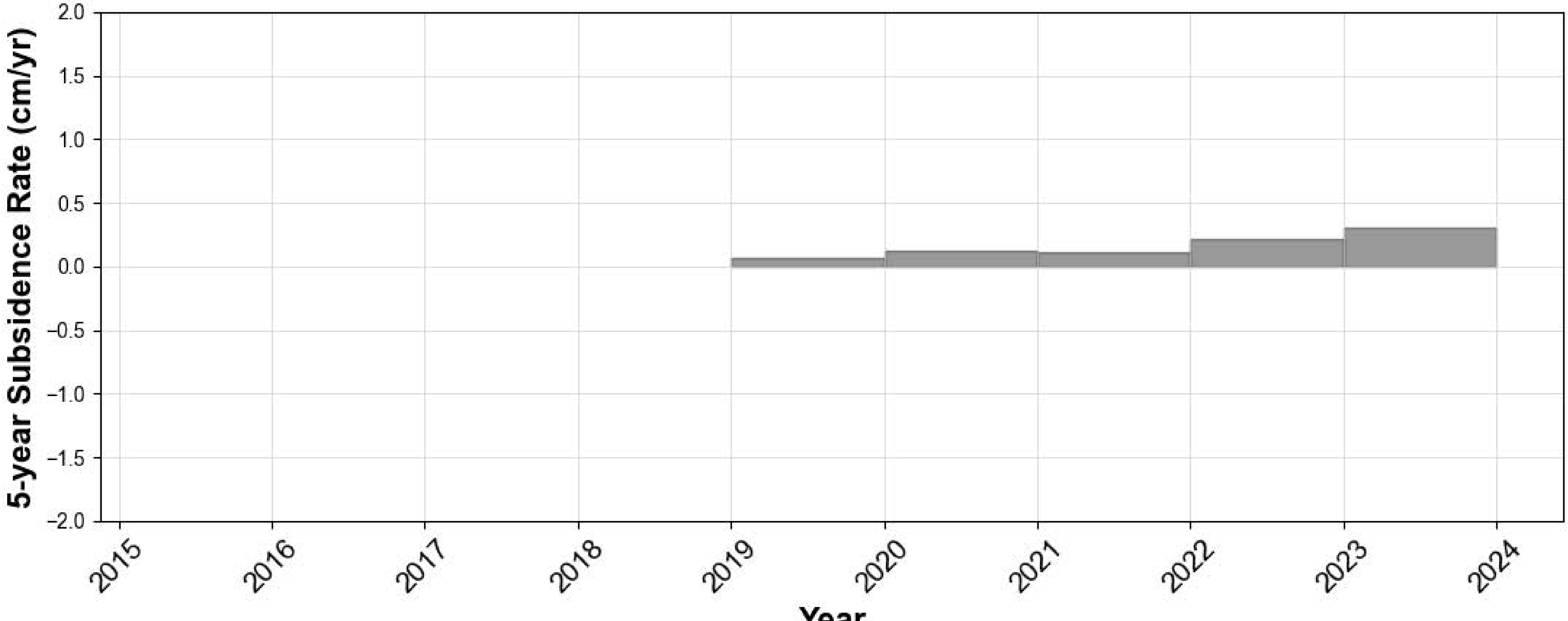
Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

TXVC

Victoria, TX



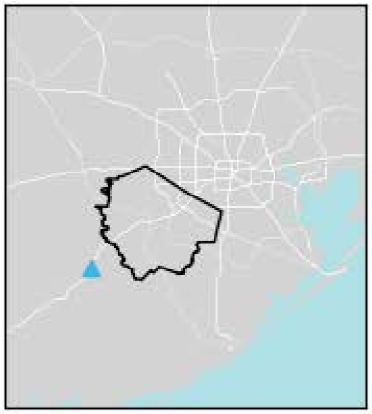


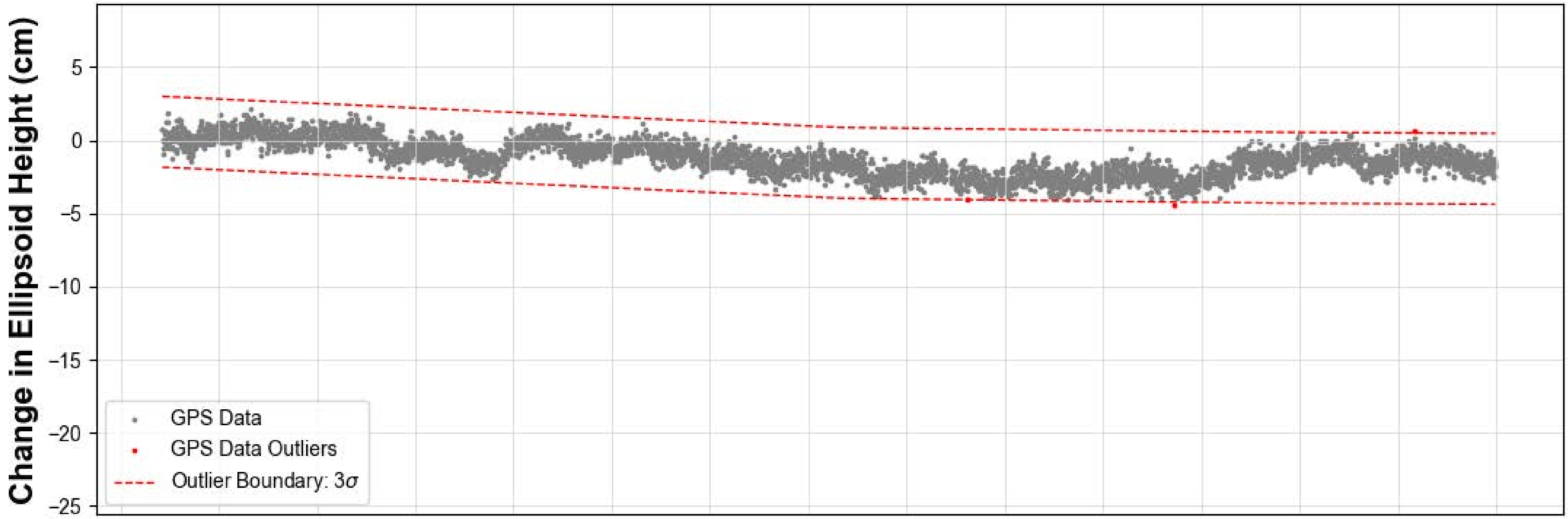


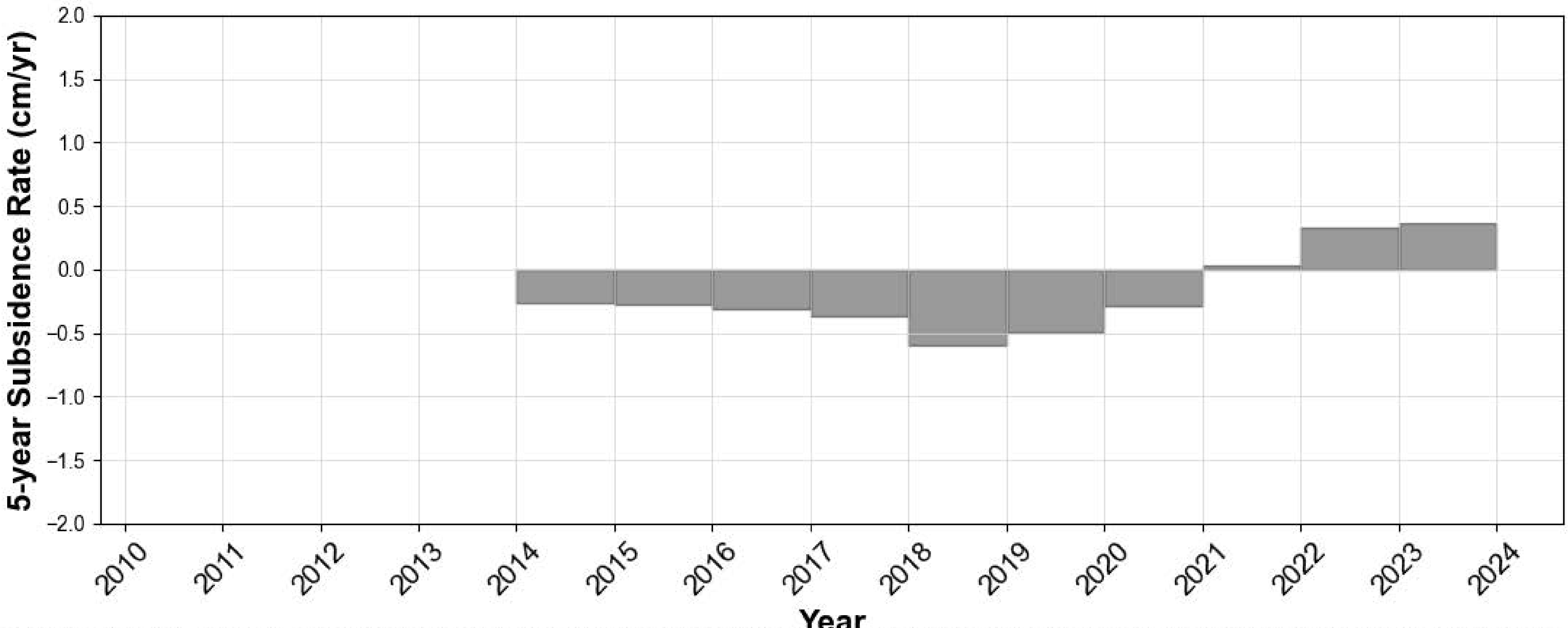
Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

TXWH

Wharton, TX



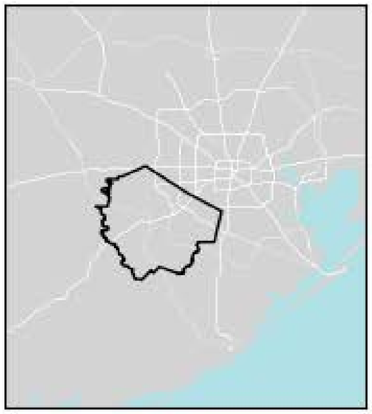


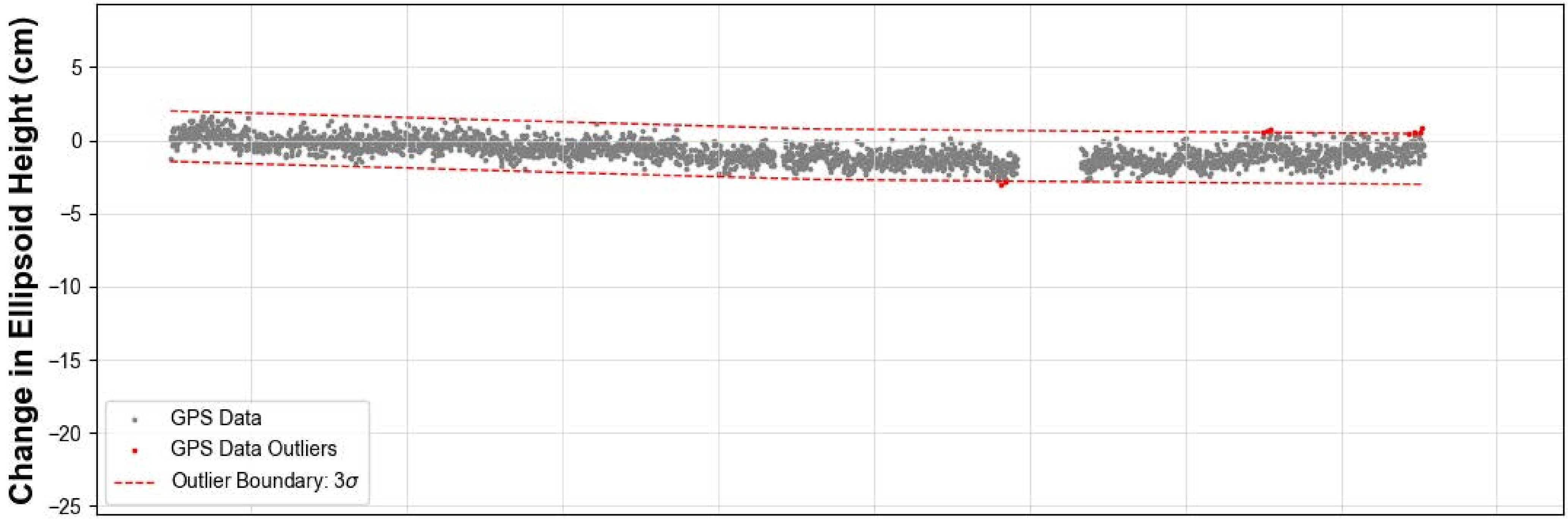


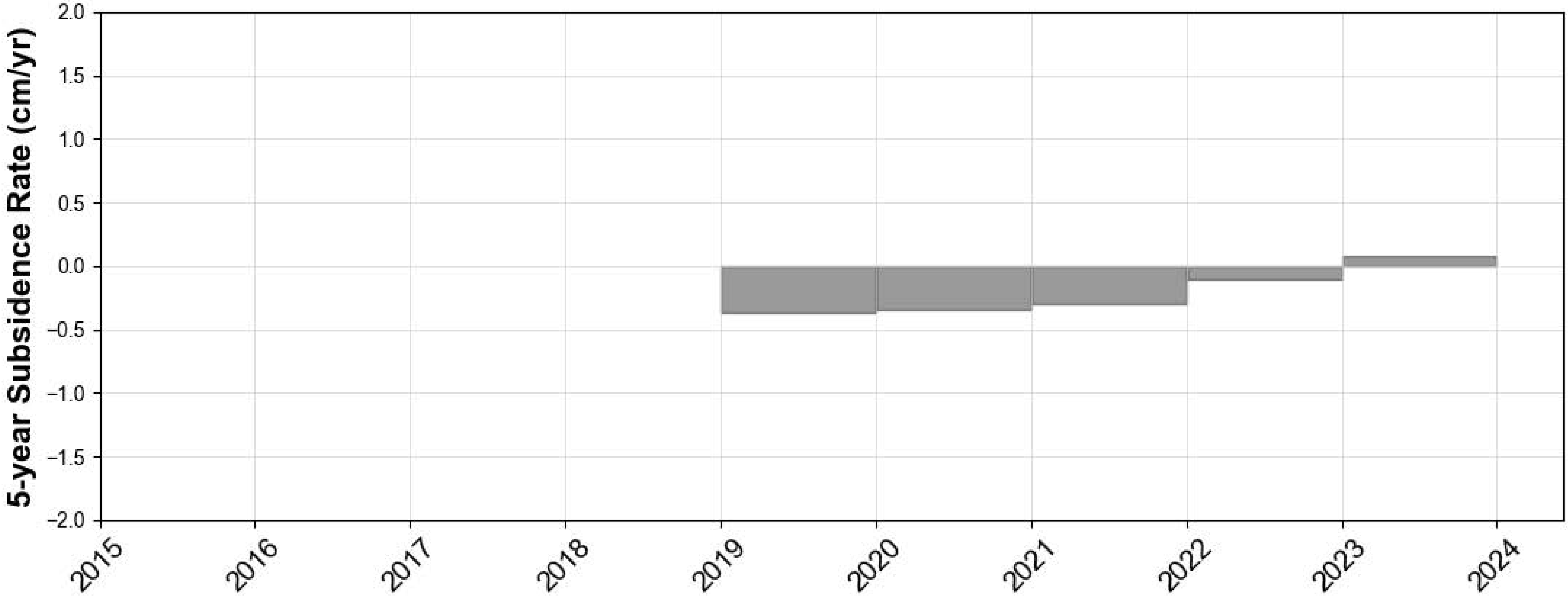
Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

TXWI

Winnie, TX



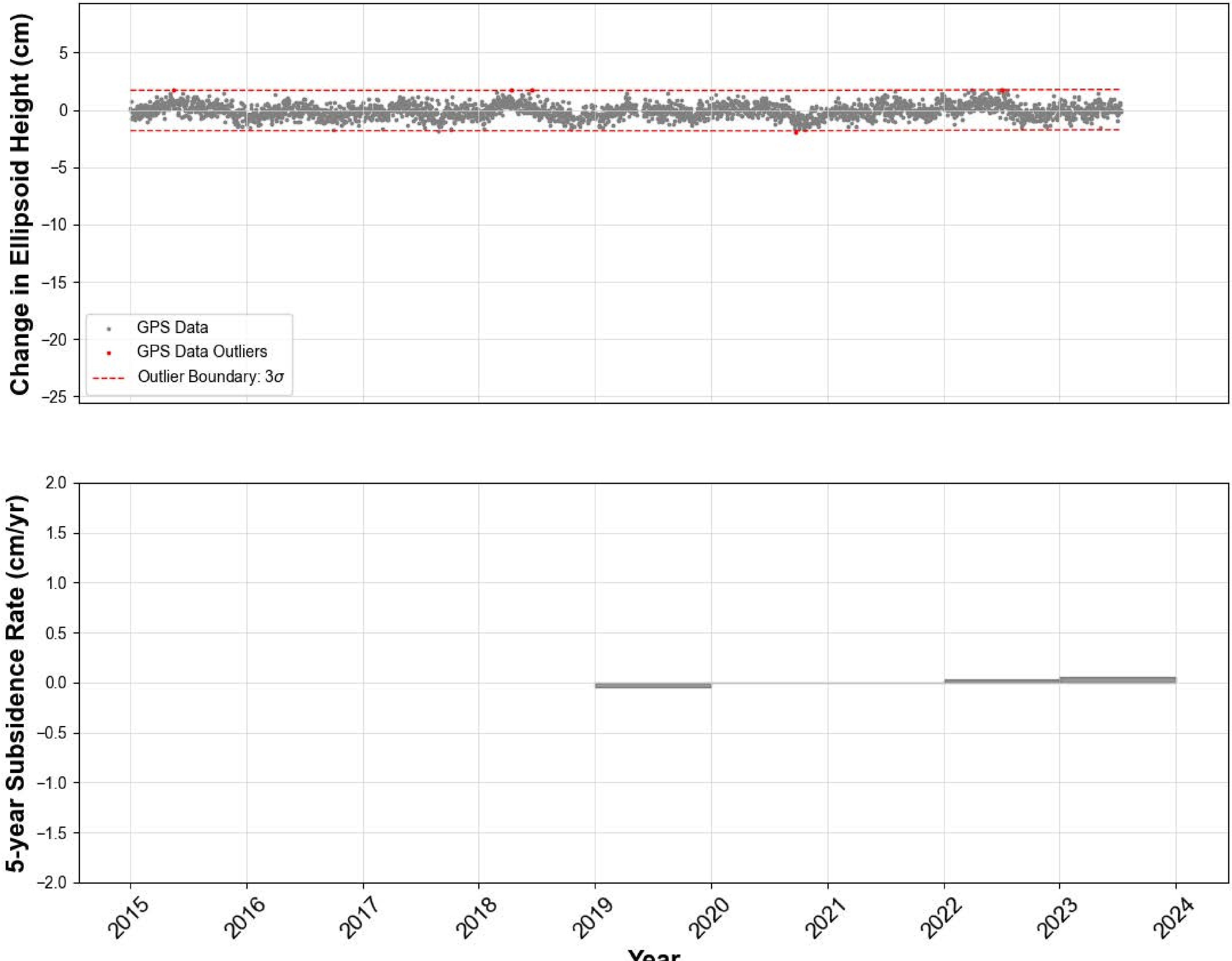




Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

TXWN

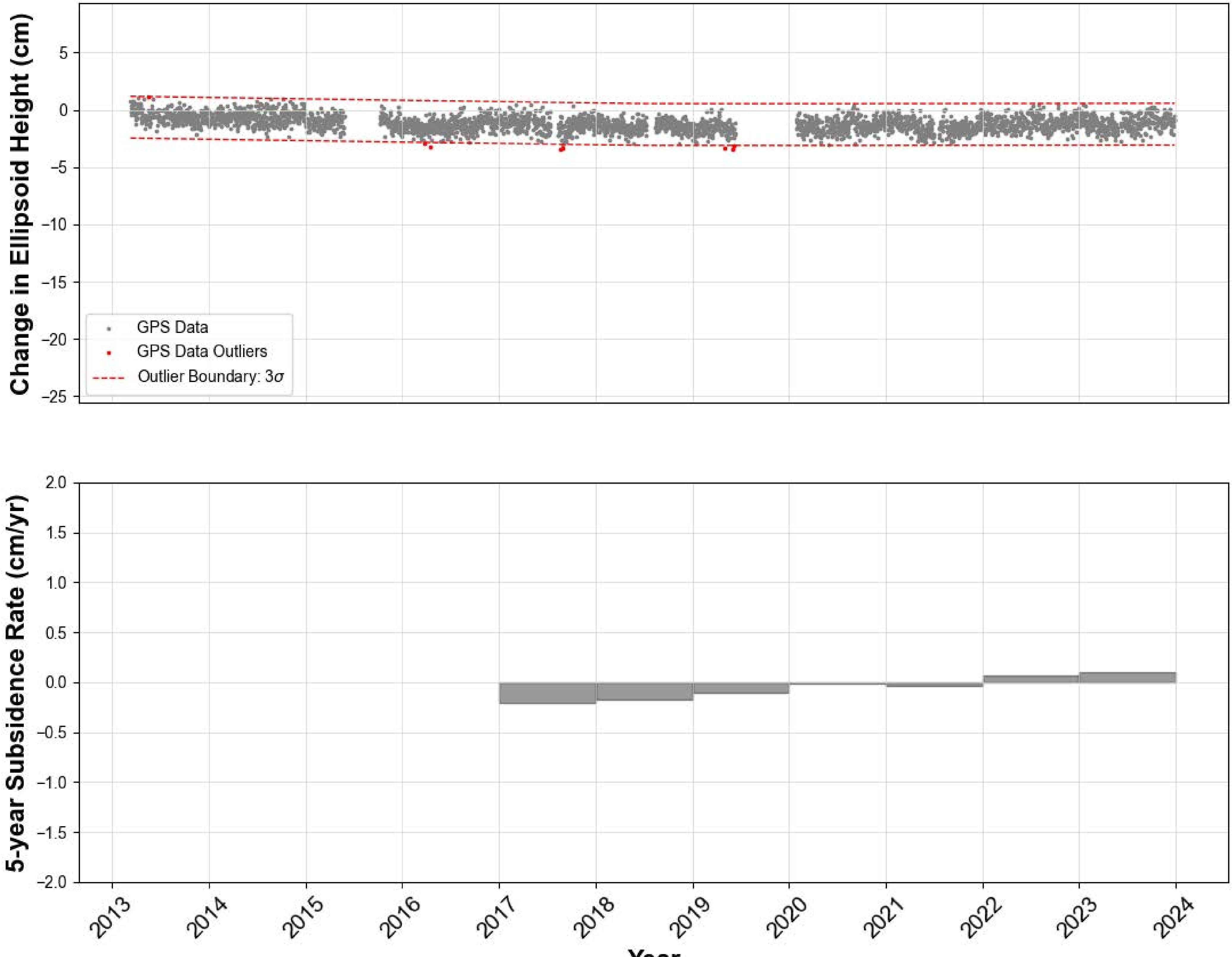
Wharton, TX



Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

TXWO

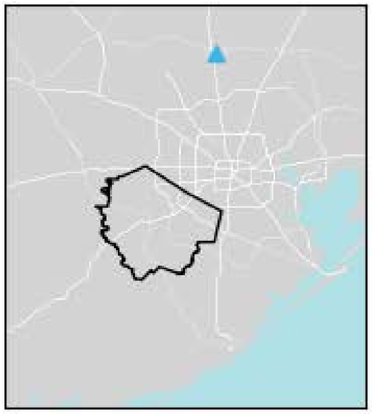
Woodville, TX

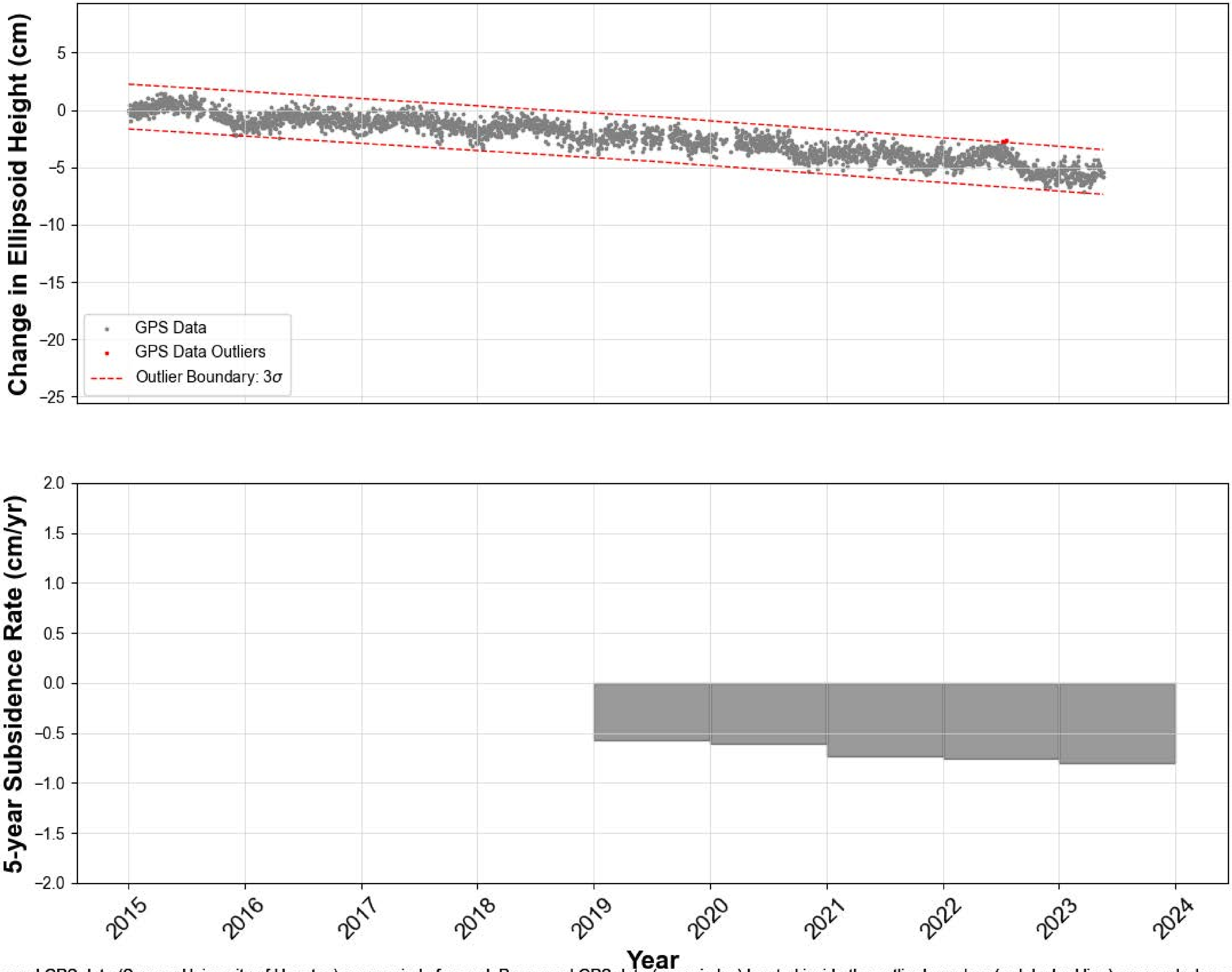


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

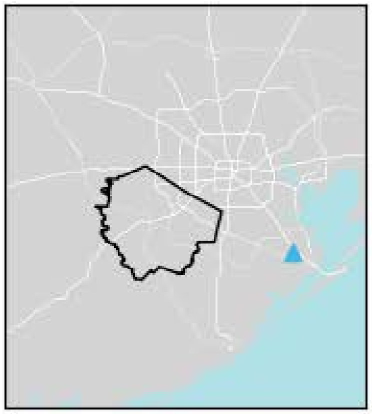
UH02

Conroe, TX



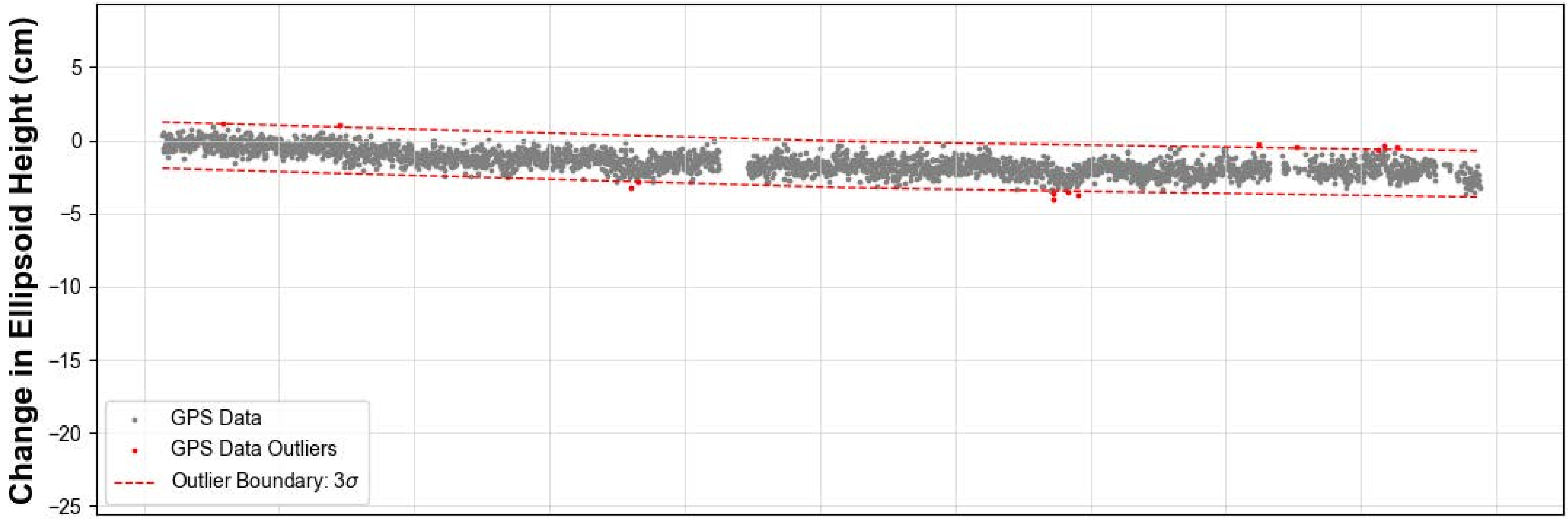


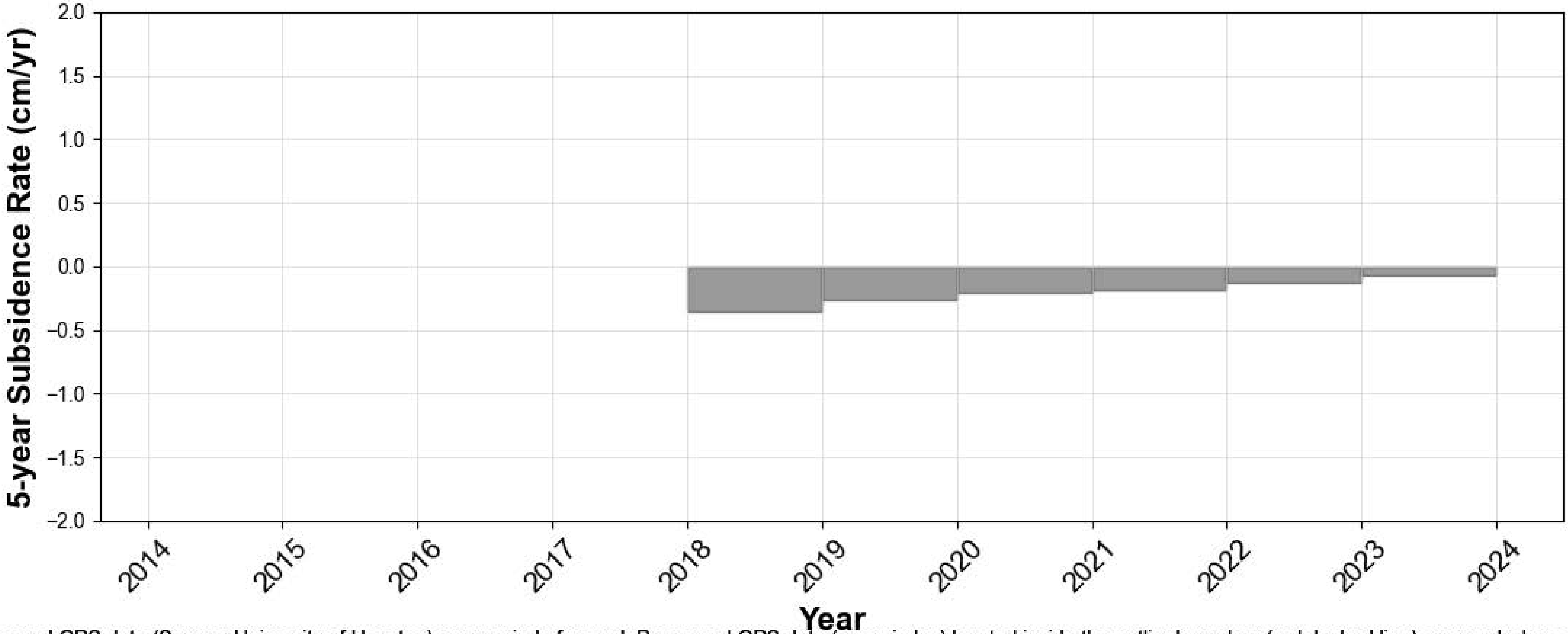
Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.



UHC1

La Marque, TX

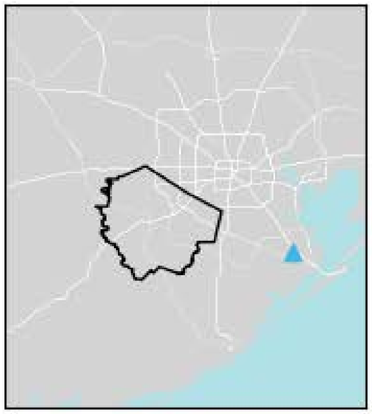


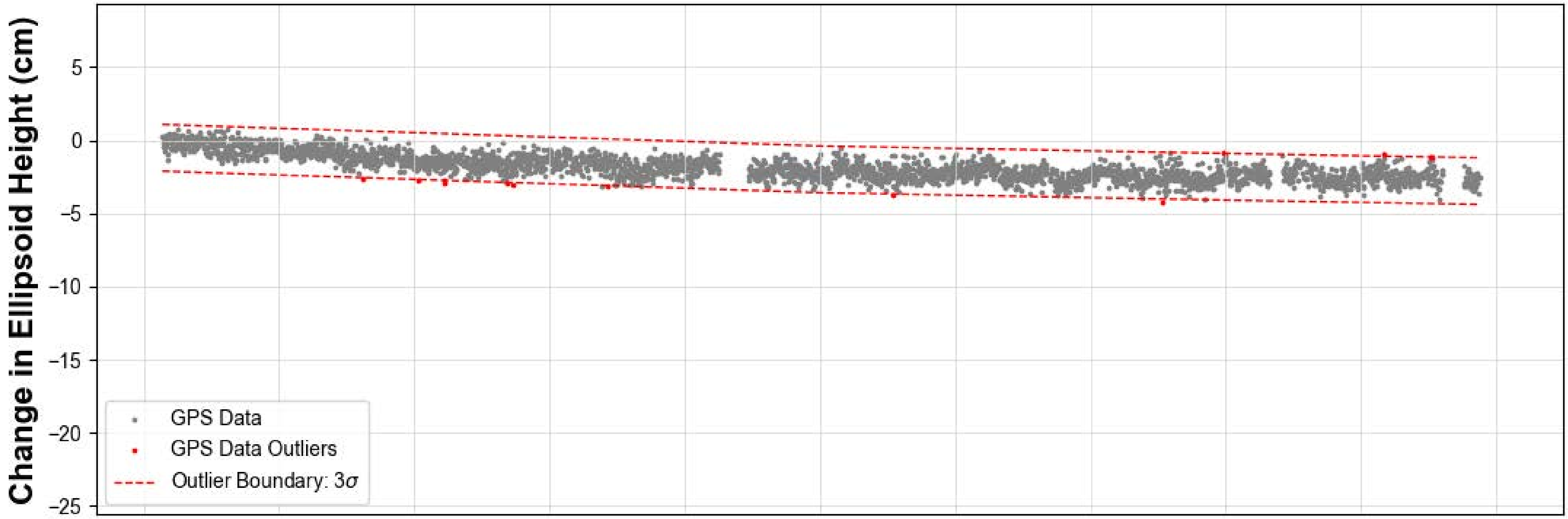


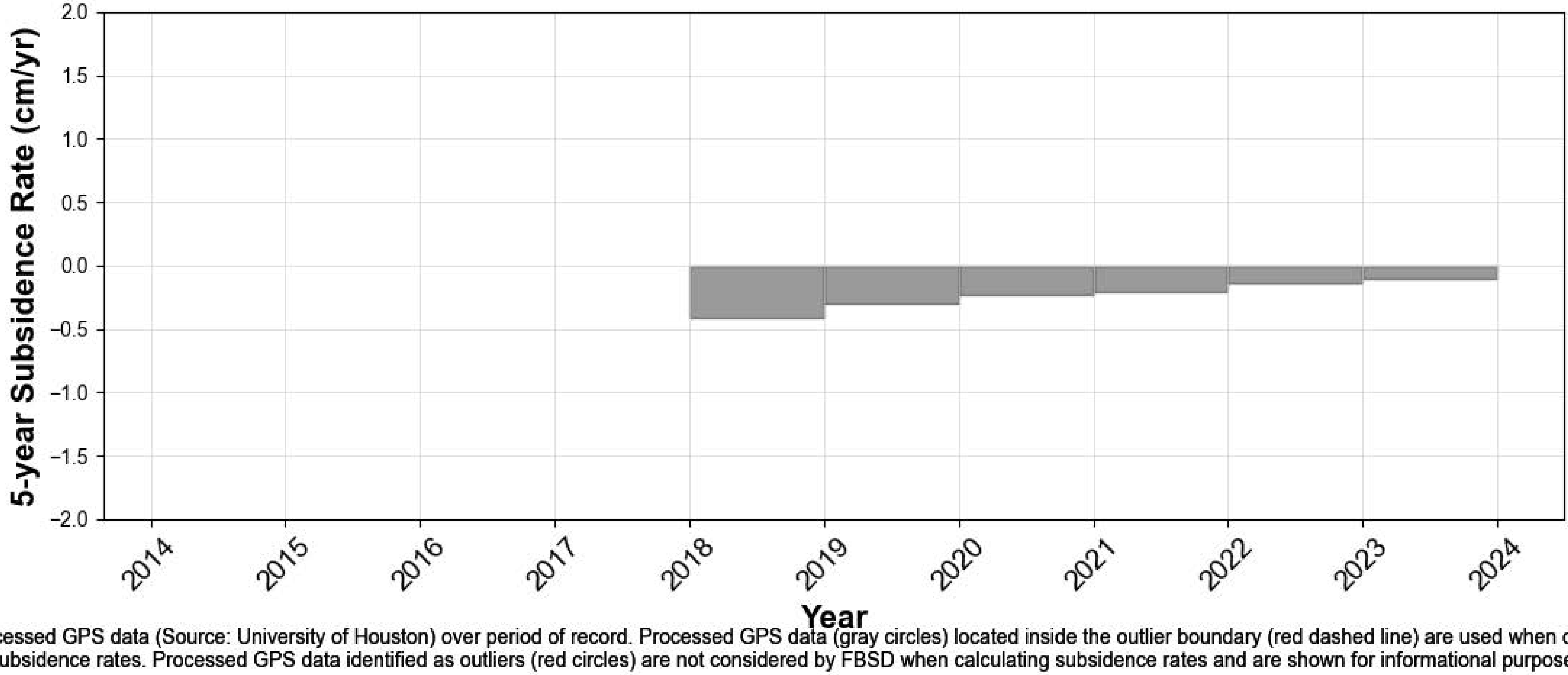
Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

UHC2

La Marque, TX



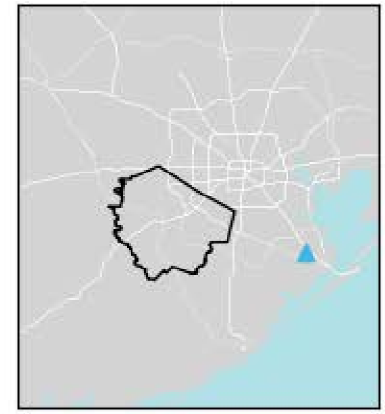


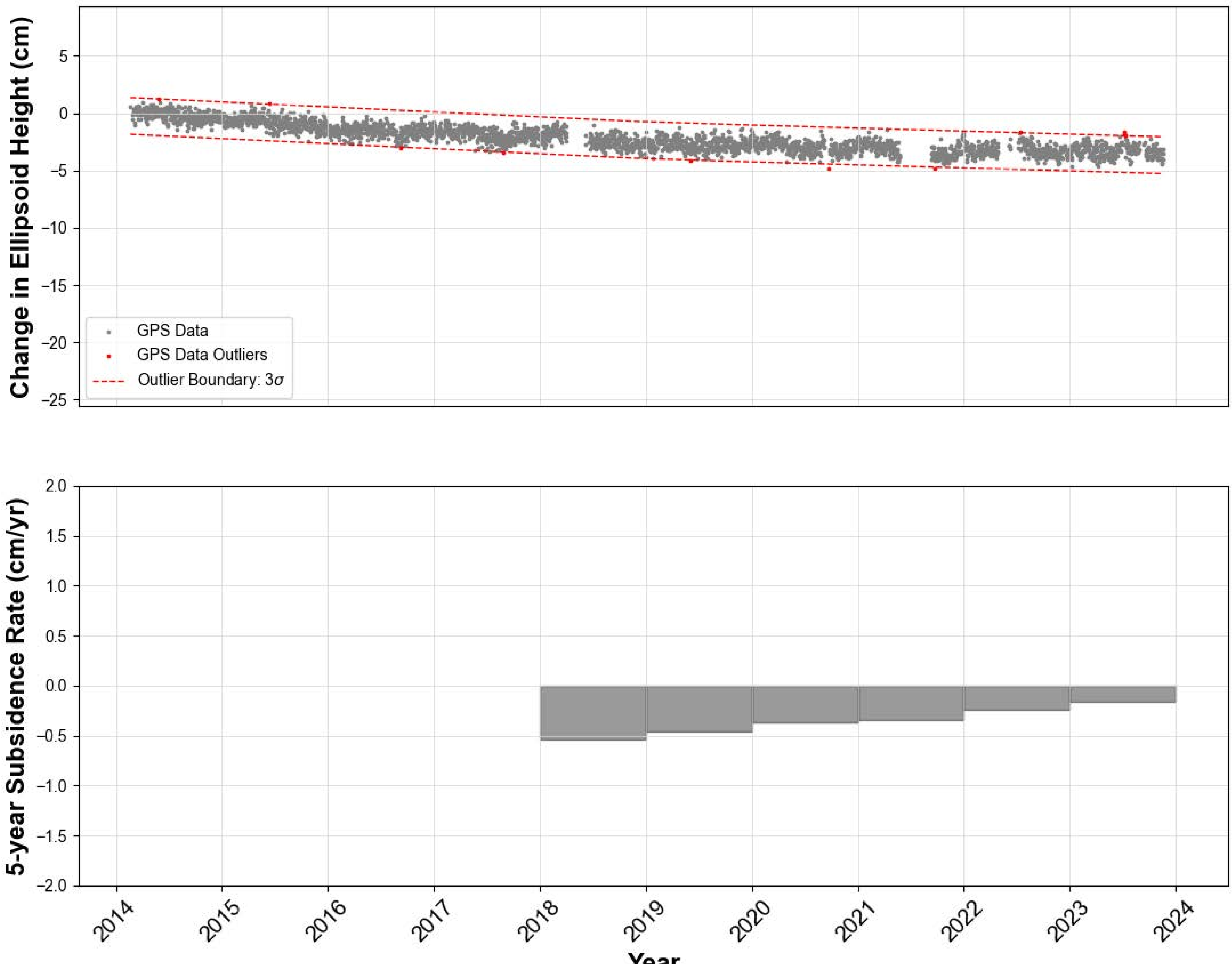


Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

UHC3

La Marque, TX

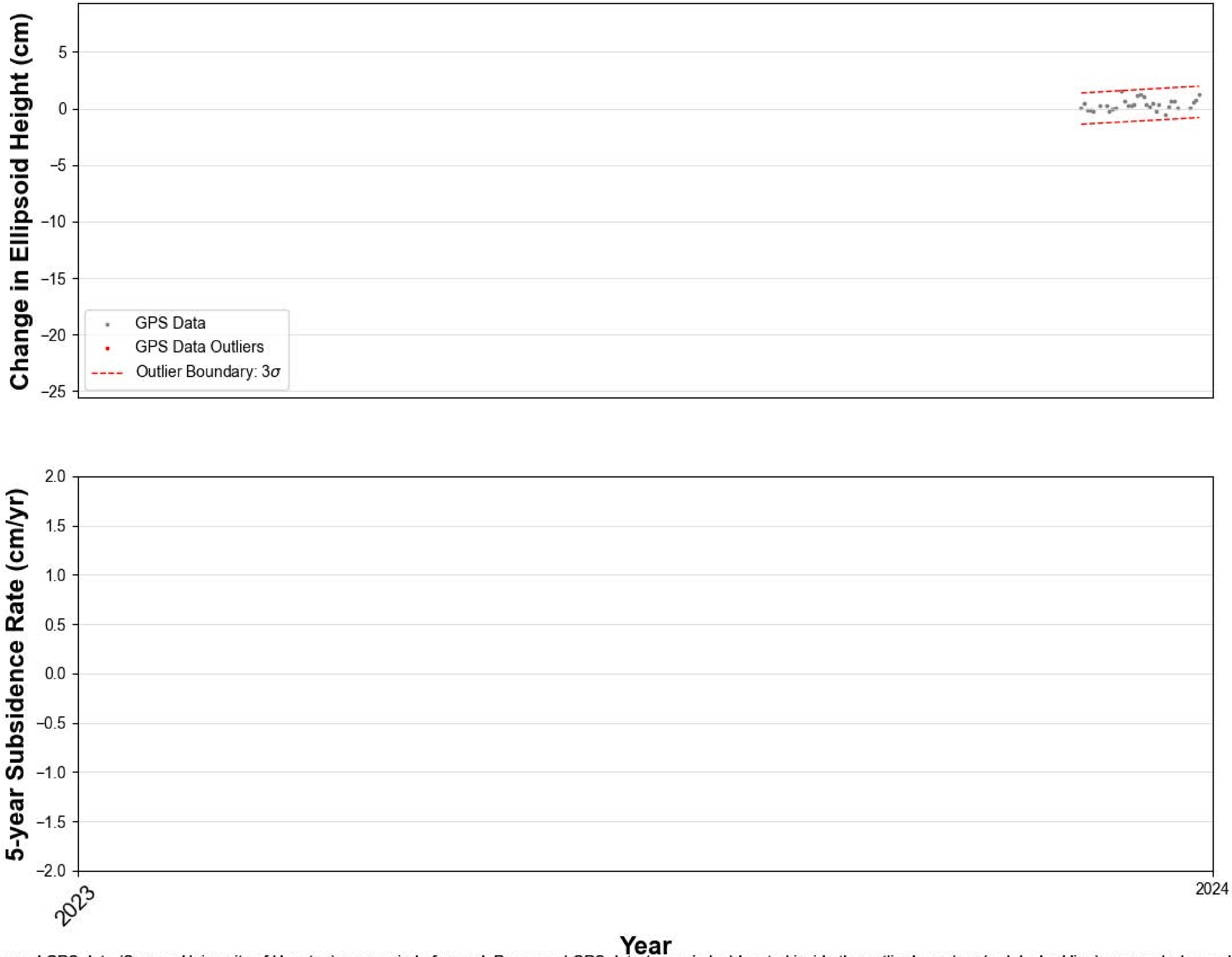




Processed GPS data (Source: University of Houston) over period of record. Processed GPS data (gray circles) located inside the outlier boundary (red dashed line) are used when calculating subsidence rates. Processed GPS data identified as outliers (red circles) are not considered by FBSD when calculating subsidence rates and are shown for informational purposes only.

UHC4

La Marque, TX



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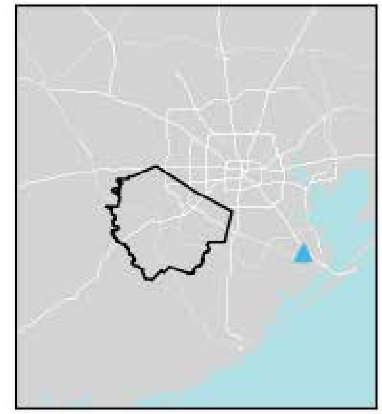
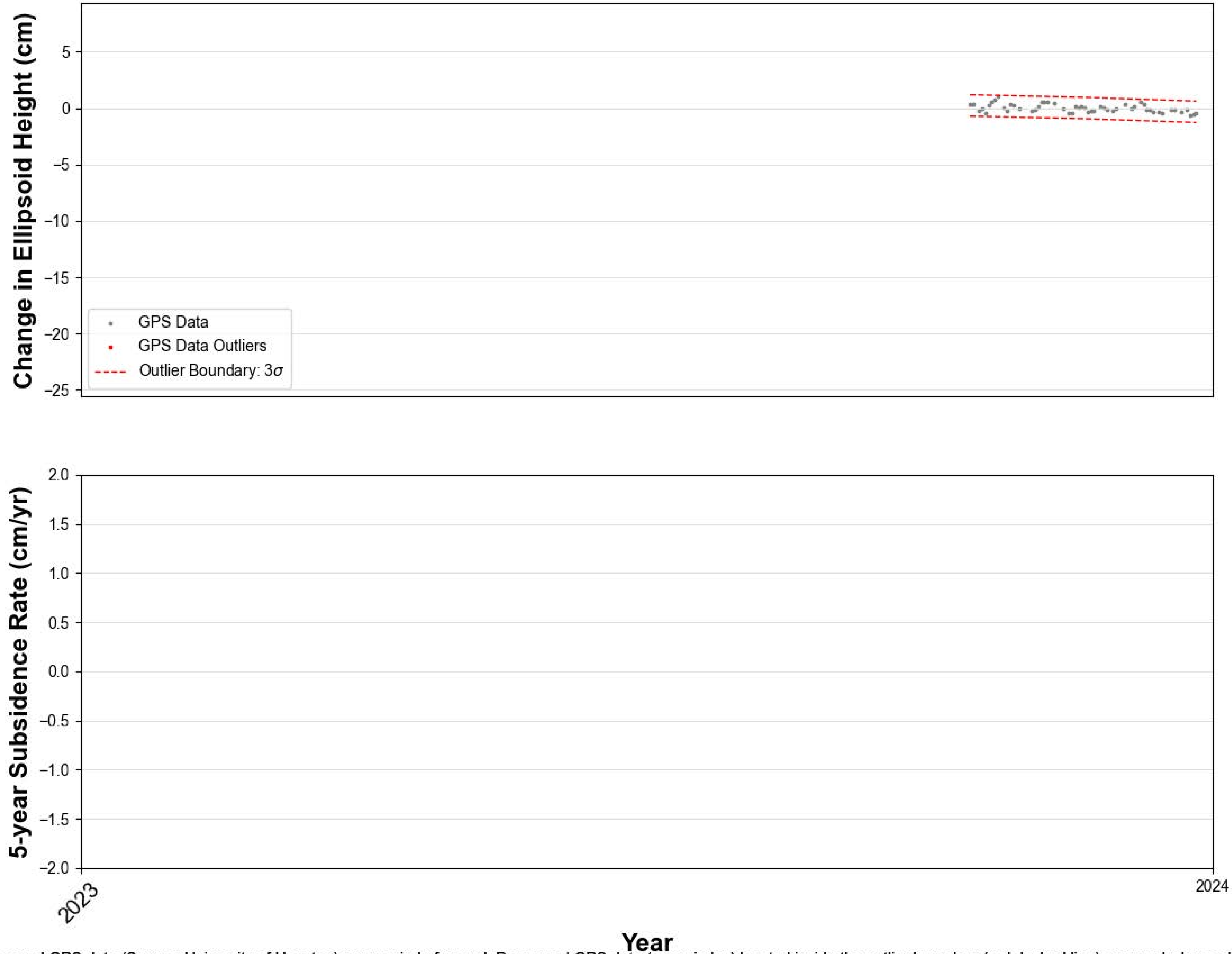
UHC5

La Marque, TX





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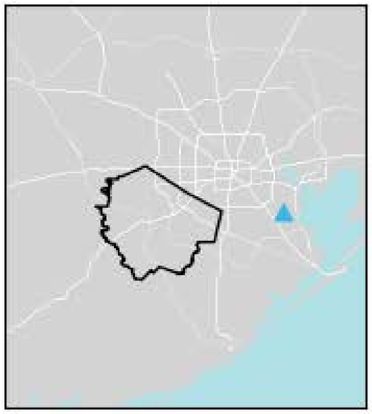
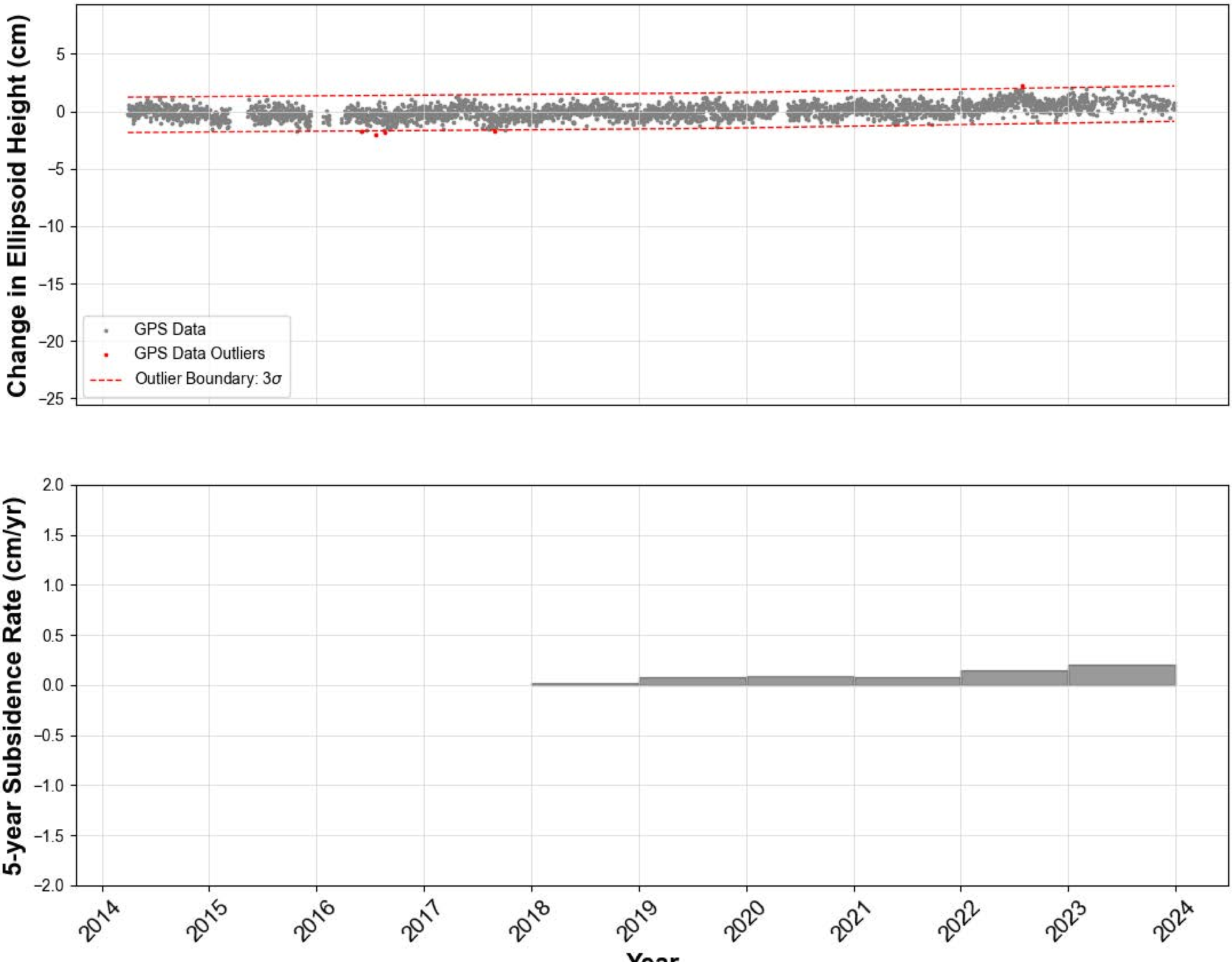
UHCL

Houston, TX





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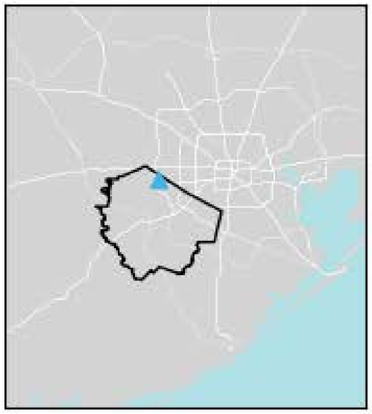
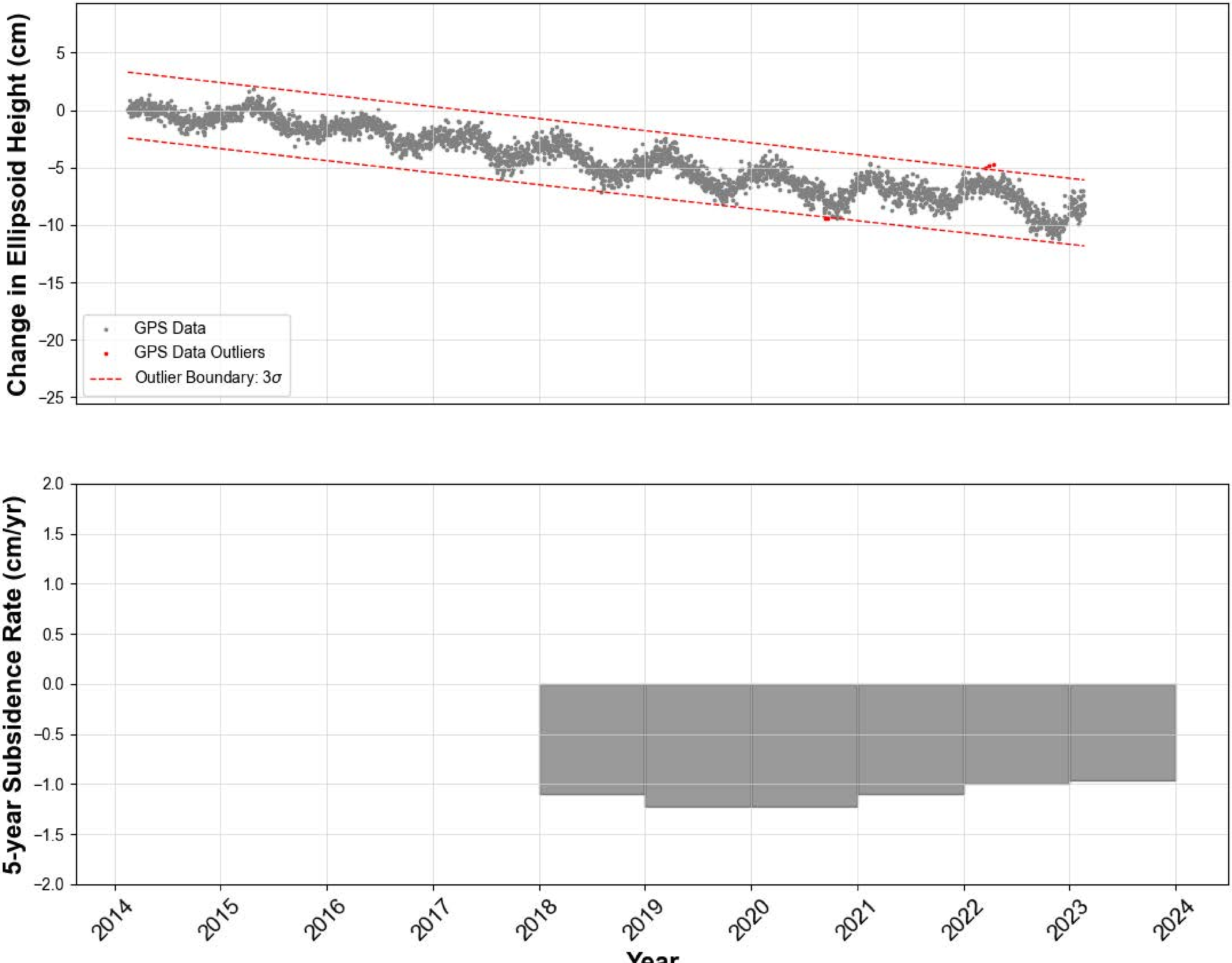
UHCR

Katy, TX





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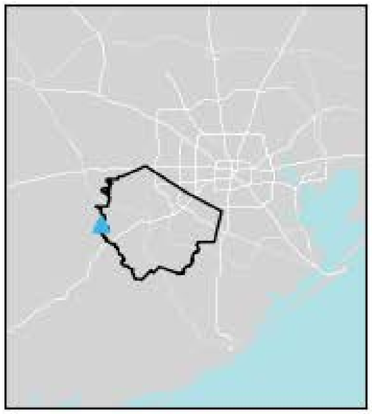
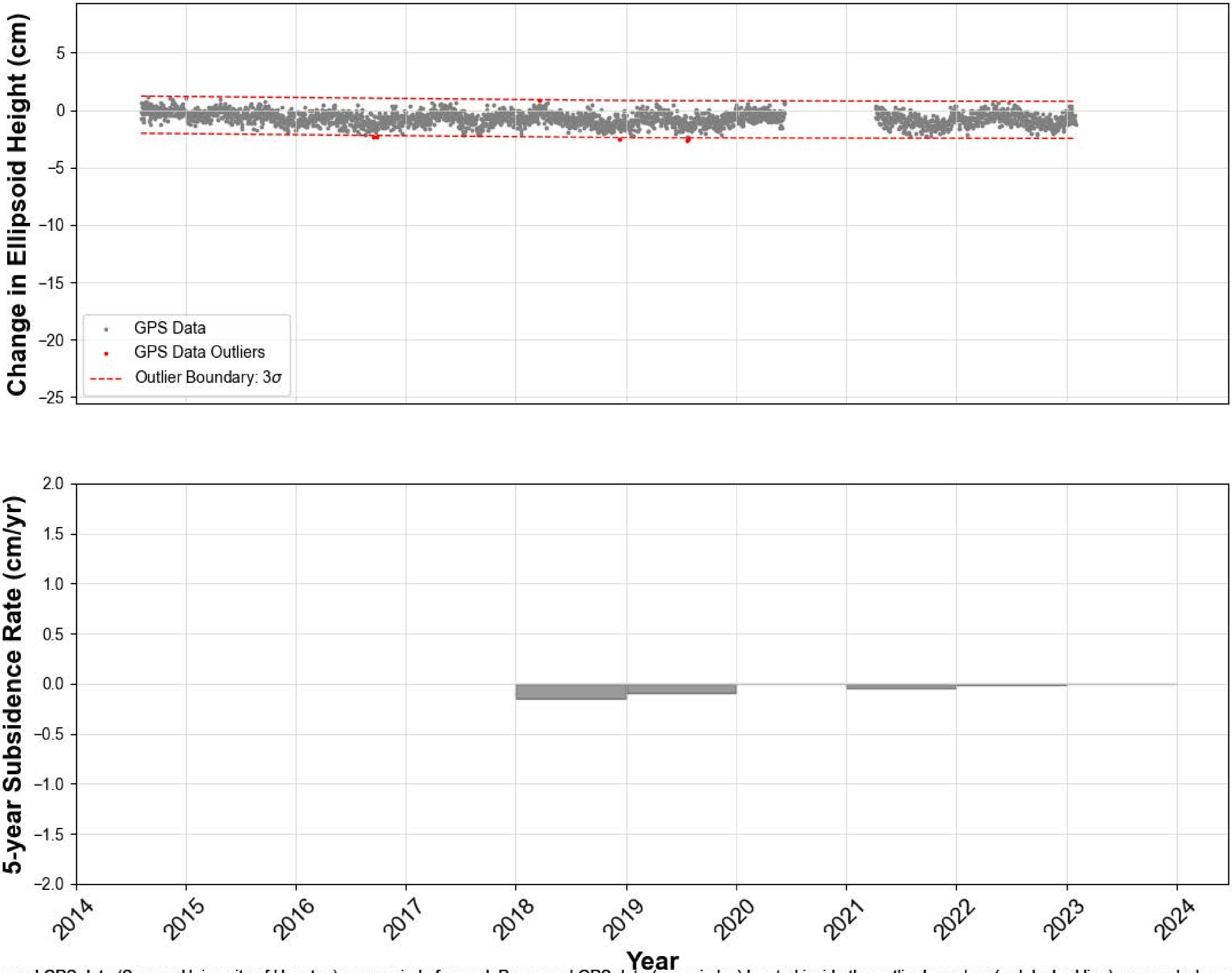
UHEB

East Bernard, TX





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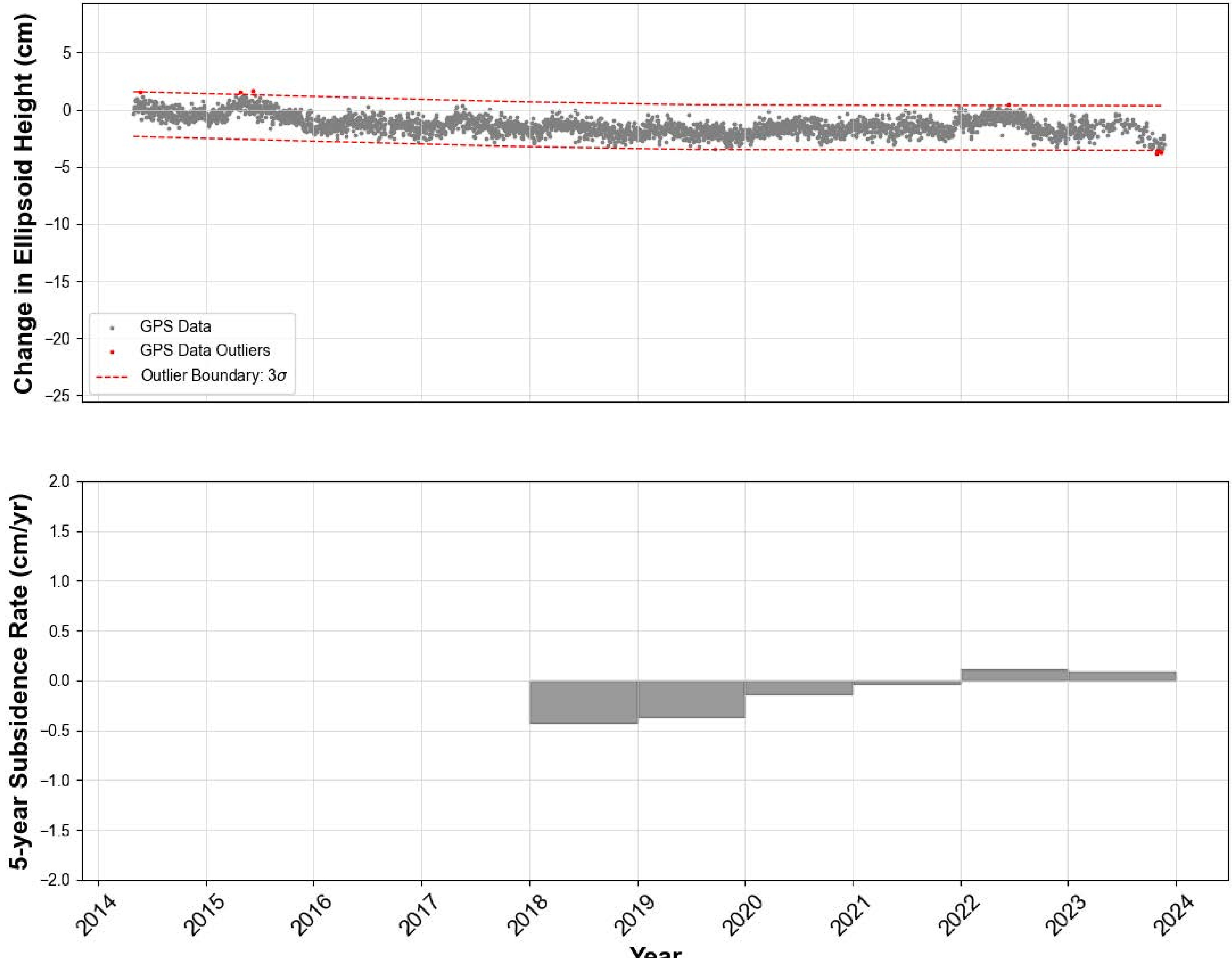
UHRI

Houston, TX



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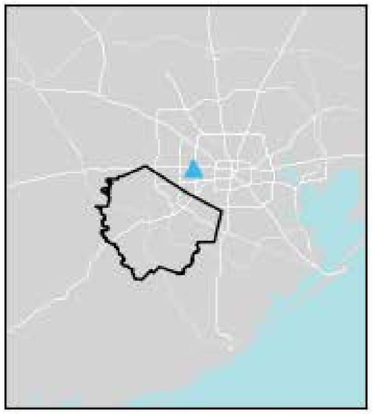
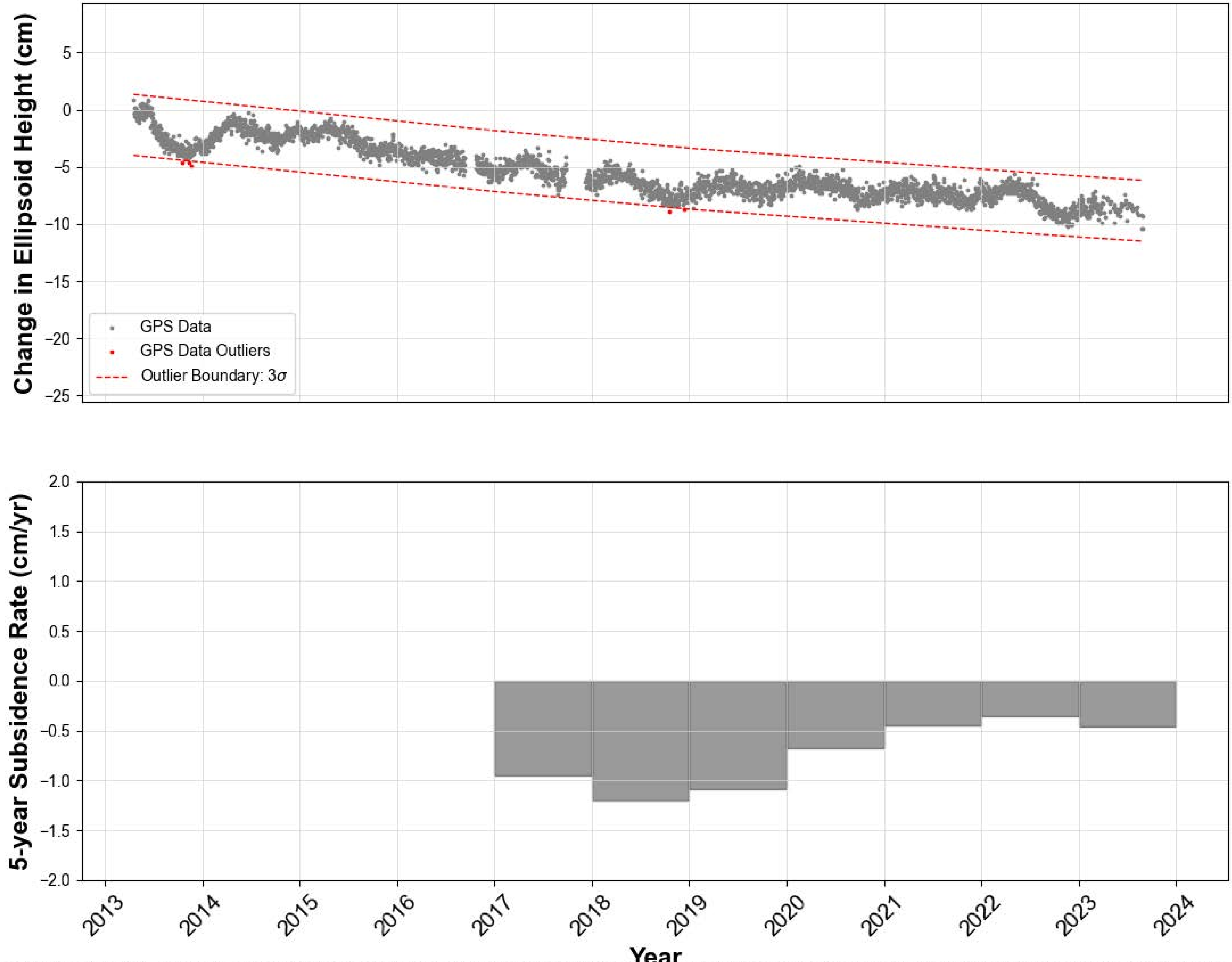
WCHT

Houston, TX





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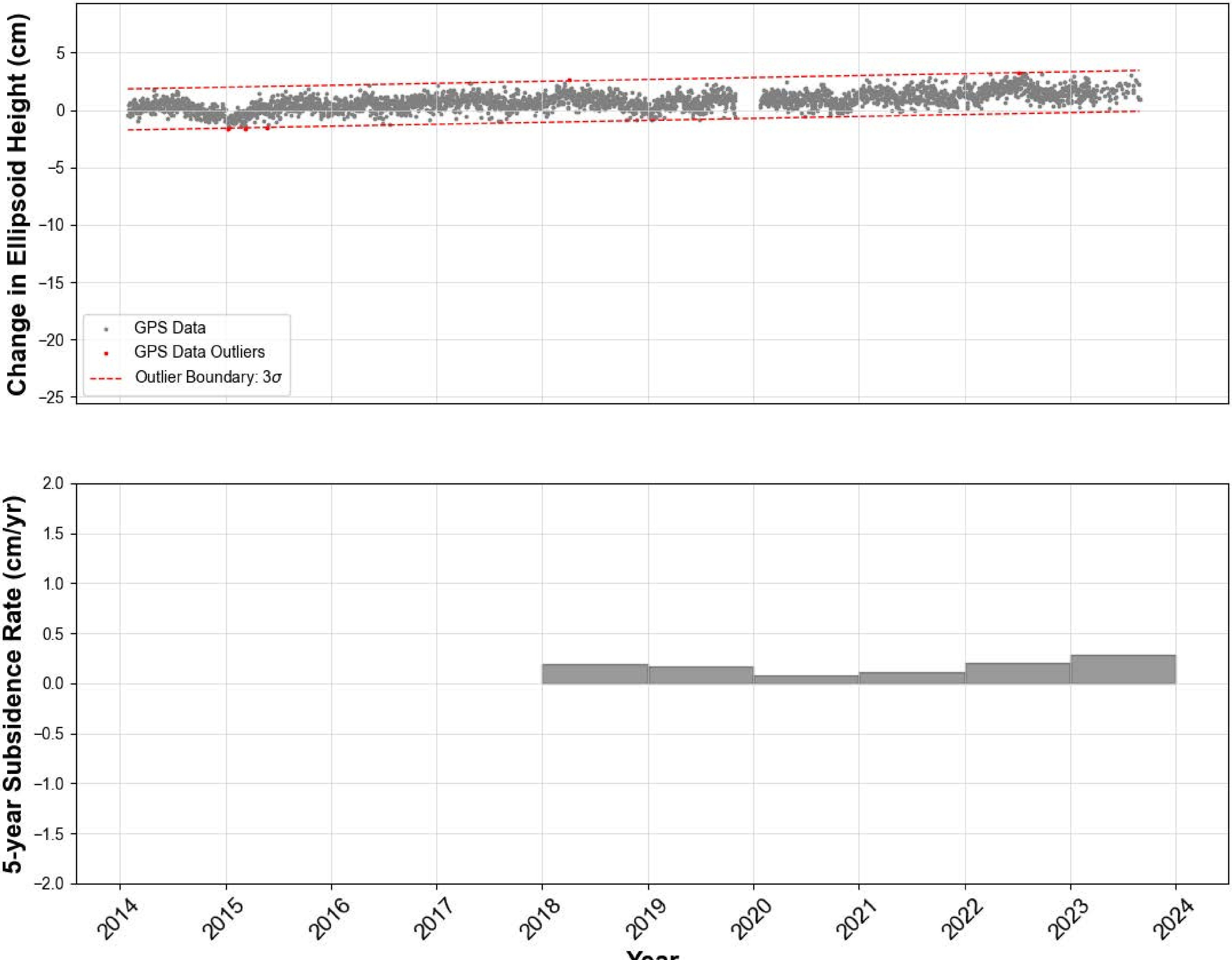
WEPD

Pasadena, TX



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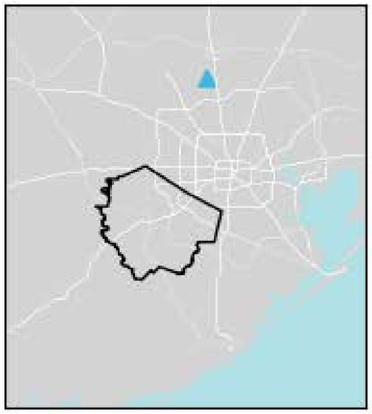
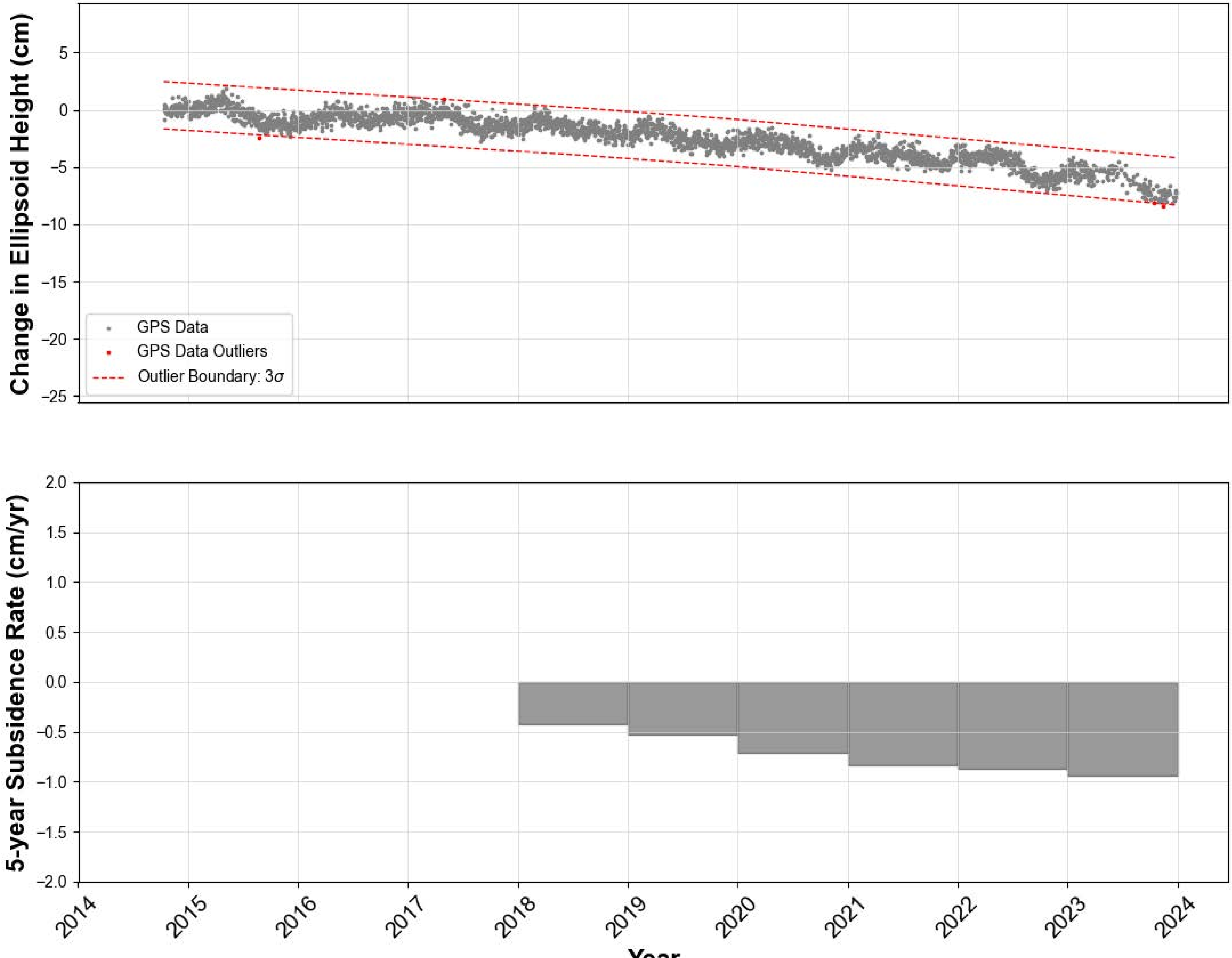
WHCR

The Woodlands, TX





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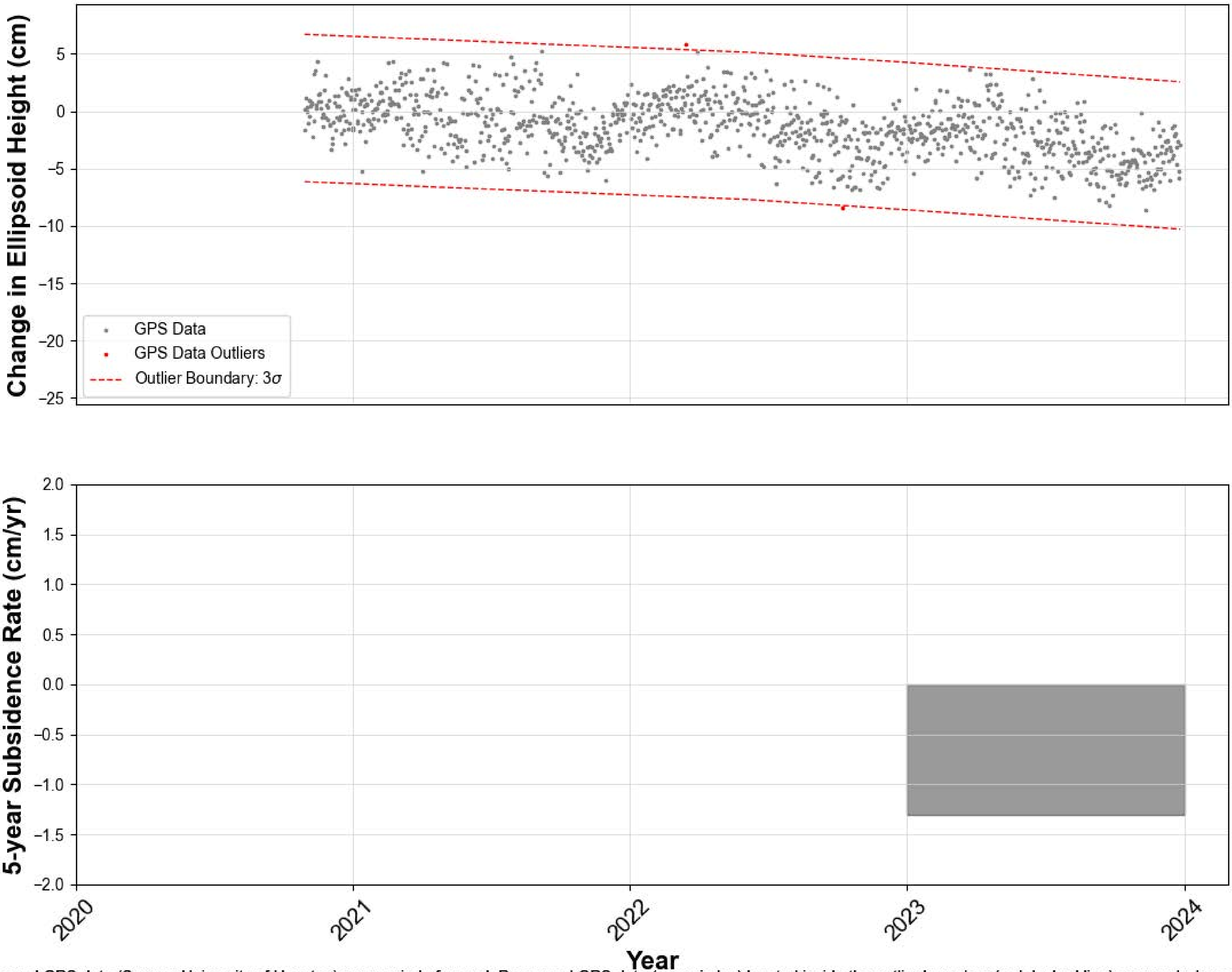
YORS

The Woodlands, TX



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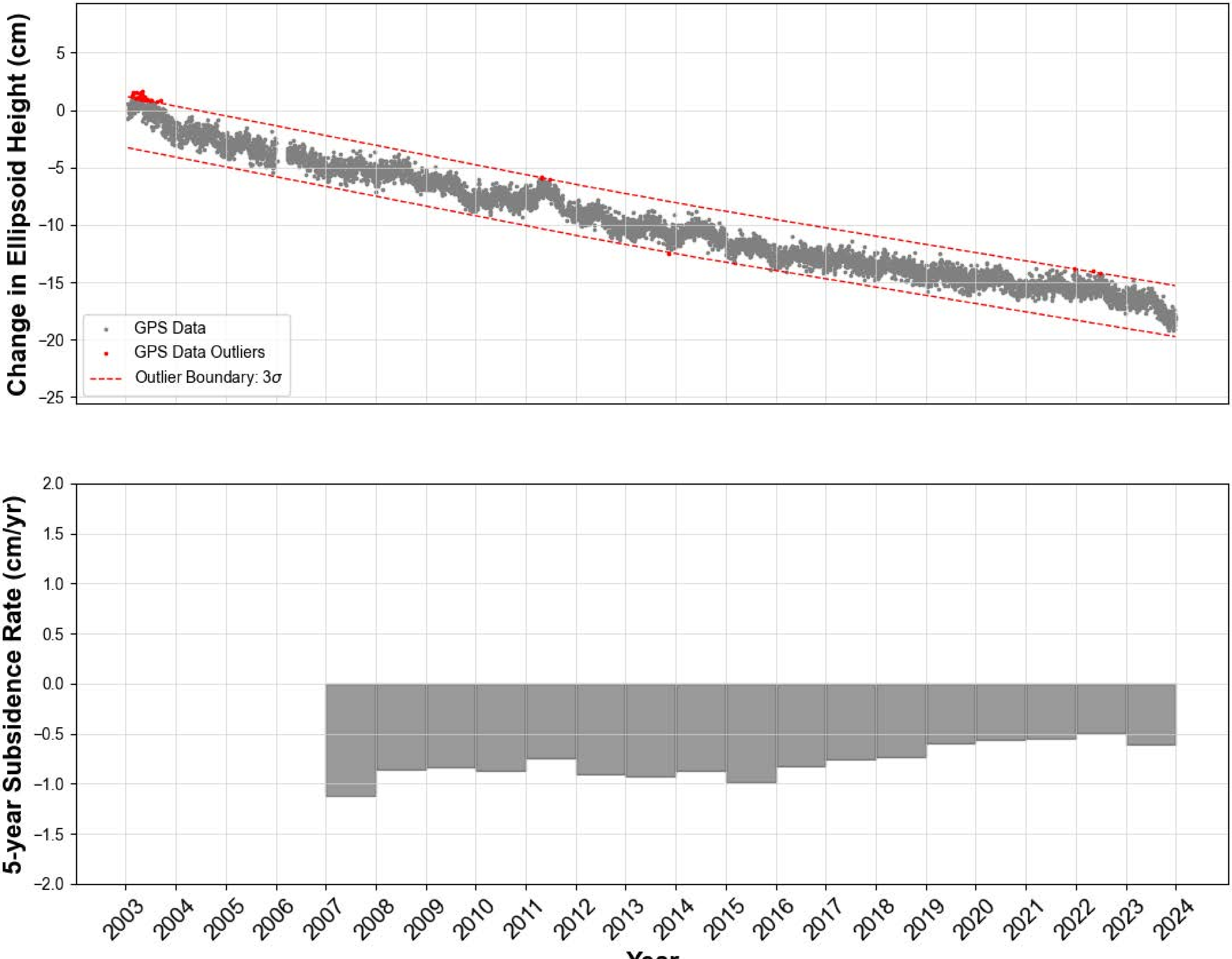
ZHU1

Houston, TX



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Appendix C – Public Testimony and Comment

The public hearing for the 2023 Annual Groundwater Report was held on April 25, 2024, and the record remained open for public testimony and comment until May 3, 2024. Two questions were received and answered at the public hearing and are summarized below.

Question 1: What are the causes of compaction degree of error due to build-up of land subdivisions?

Response: Mr. Jason Ramage (Hydrologist, USGS) answered that Fort Bend County only has one extensometer in Cinco MUD that was completed in 2017 in a developed area. Extensometers record changes in the aquifer thickness at specific depth intervals and do not measure changes in land use at the surface.

Question 2: What causes compaction?

Response: Mr. Ramage explained that for this region compaction is caused from significant groundwater withdrawal as evident in the historical record from other extensometers in the Houston region as noted in the recent publication of the GULF report, which is available online at https://pubs.usgs.gov/publication/pp1877.

Question 3: What are other causes of reservoir decline or increase like recharge zone?

Response: Mr. Ramage and Ms. Ashley Greuter (Director, FBSD) responded that groundwater recharge occurs in the outcrops areas where rain can infiltrate the groundwater system. Recharge rates vary based on precipitation, land use, soil types, vegetative cover and tend to be higher in areas with larger amounts of sand than clays. Recharge rates of the Chicot range from 0.2 to 7.2 inches per year and recharge rates of the Evangeline can be 0.1 to 2.8 inches per year. Additional information on groundwater recharge can be found at https://pubs.usgs.gov/fs/2013/3043/pdf/fs2013-3043.pdf.

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