

**TSX/PAZ Satellite Update**  
**InSAR Subsidence**  
April 20 & 22, 2023

Longquist comment:

The SNT satellite passed by Sulphur on Wednesday April 19 and we received the dataset on Friday. This dataset has been evaluated and a report prepared using the new methodology proposed in the Enhanced Monitoring Plan submitted with the LDNR order response. Please find report attached.

Additionally, the TSX satellite passed by Sulphur on Thursday April 20 and the TSX/PAZ constellation passed by on Saturday April 22. We received the datasets Saturday and this morning, respectively. Reporting under the new methodology is still under development for the TSX data. The attached time series plots have been prepared using the current evaluation method for those datasets.

All data was reviewed preliminarily on the day it was received to confirm that none of the datapoint areas around the dome and caverns near the western flank were showing deviation from established trends.



# TSX Satellite Update

## Continuous InSAR Monitoring of Ground Displacement Near Western Caverns and Dome Flank

Sulphur Dome  
Westlake Chemicals

April 20, 2023 Update



Date Signed: April 24, 2023  
Austin, TX

Nathaniel L. Byars, P.E.  
Principal Engineer  
Louisiana License No. 40697

**LONQUIST & CO. LLC**

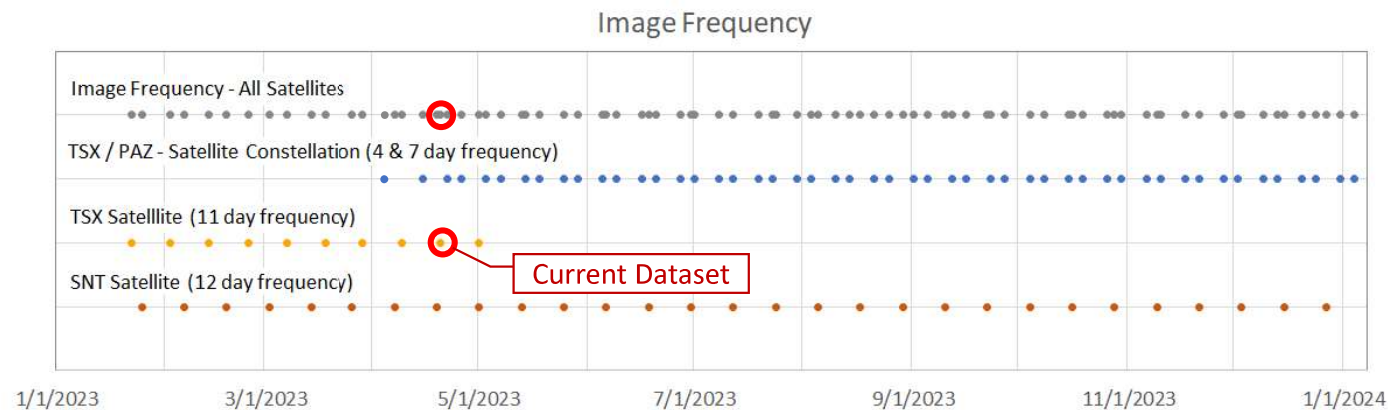
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ENGINEERS

ENERGY  
ADVISORS

# Parameters of InSAR Dataset and Collection Frequency

- Current Satellite and Data Delivery Frequency:
  - Sentinel 1 (SNT)  
12 days
  - TerraSAR-X (TSX)  
11 days
  - 5.40-day avg. frequency
- Starting April 2023:
  - Sentinel 1 (SNT)  
12 days
  - TSX / PAZ Constellation  
4 & 7 days
  - 3.96-day avg. frequency

	Sentinel-1	TerraSAR-X	TSX/PAZ Constellation	
			TerraSAR-X	PAZ
Mode / Resolution	16 x 65 ft	Spotlight (3 x 3 ft)	Spotlight (3 x 3 ft)	Spotlight (3 x 3 ft)
Track	T136	T29	T67	T120
Band (wavelength)	C-Band (2.32 in)	X-Band (1.22 in)	X-Band (1.22 in)	X-Band (1.22 in)
Nominal frequency	12- day	11- day	11- day	11- day
Orbit (LOS angle)	Ascending 43°	Descending 17°	Descending 37°	Descending 37°
Date range	04 Oct 2016 – 20 Jan 2024	16 Jun 2022 – 01 May 2023	24 Jan 2023 – 11 Jan 2024	28 Jan 2023 – 15 Jan 2024
Number of images	199	30	34	33

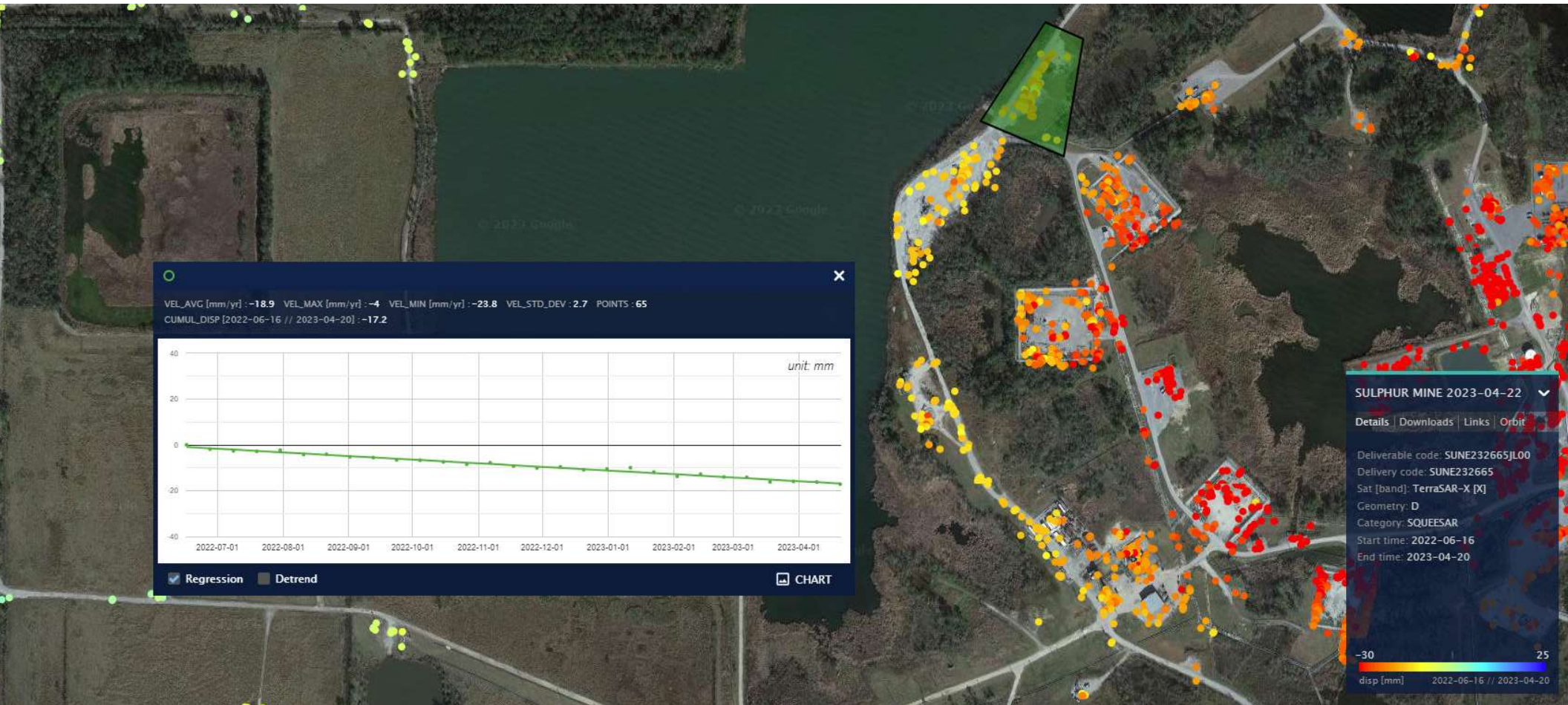


## Overview and Monitoring History

- Beginning in late January, ground displacement over the western portion of the Sulphur Mines Salt Dome has been evaluated following the delivery of each dataset update from TRE-Altamira
- An automated process and set of deliverables to convey the results of the datasets is being developed that will evaluate multiple factors including trend consistency and mapped acceleration of ground displacement
- Current updates are focused on the review of time series charts of averaged data for selections of points around the dome and caverns on the western flank
- The TSX satellite (11-day revisit) passed by Sulphur on Thursday April 20, 2023
- The following slides present the time series and associated linear trends for each location evaluated from this dataset
- To-date there has been no material deviation from the established subsidence trends in the areas investigated

# TSX Satellite – April 20, 2023 Update

# PPG 21



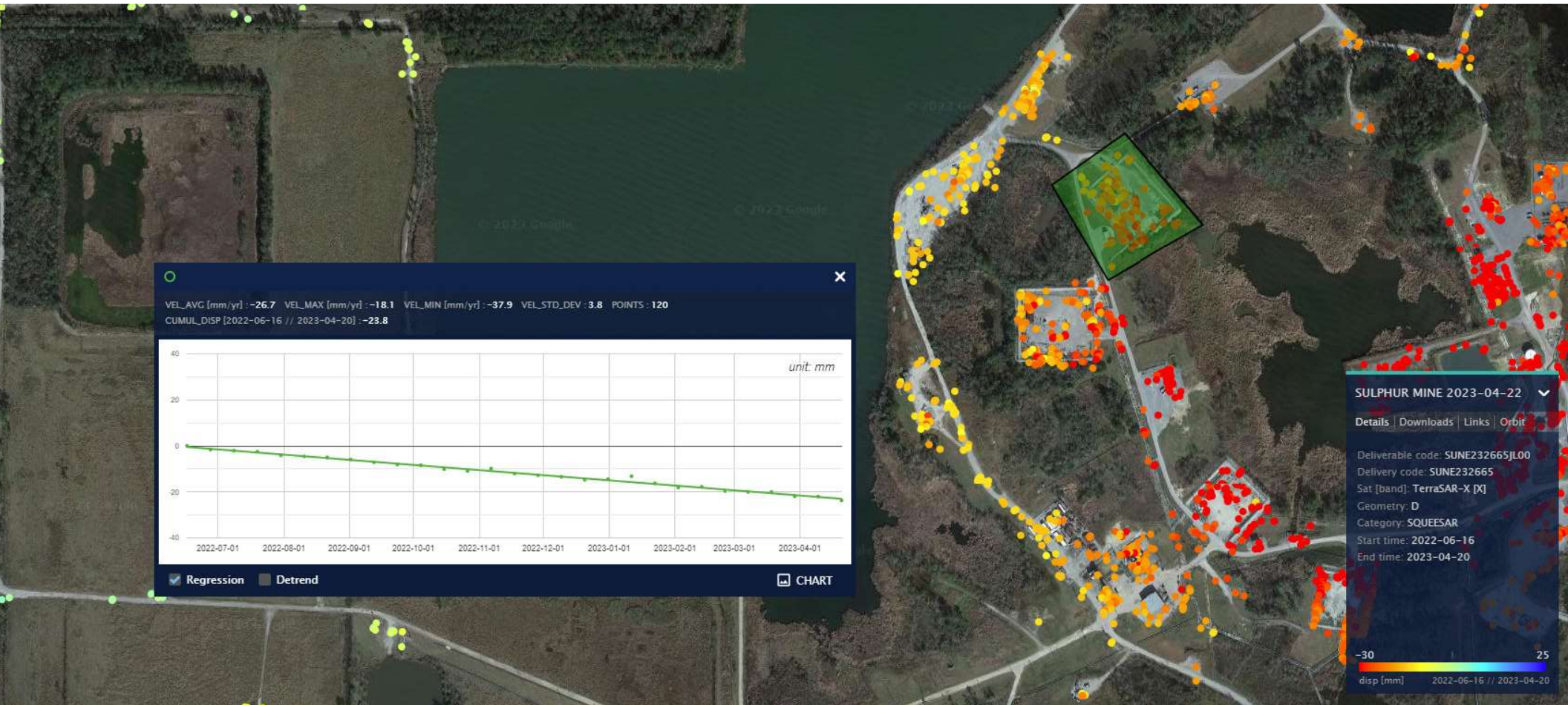
4/24/2023

Continuous Monitoring of Ground Subsidence

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## PPG 6



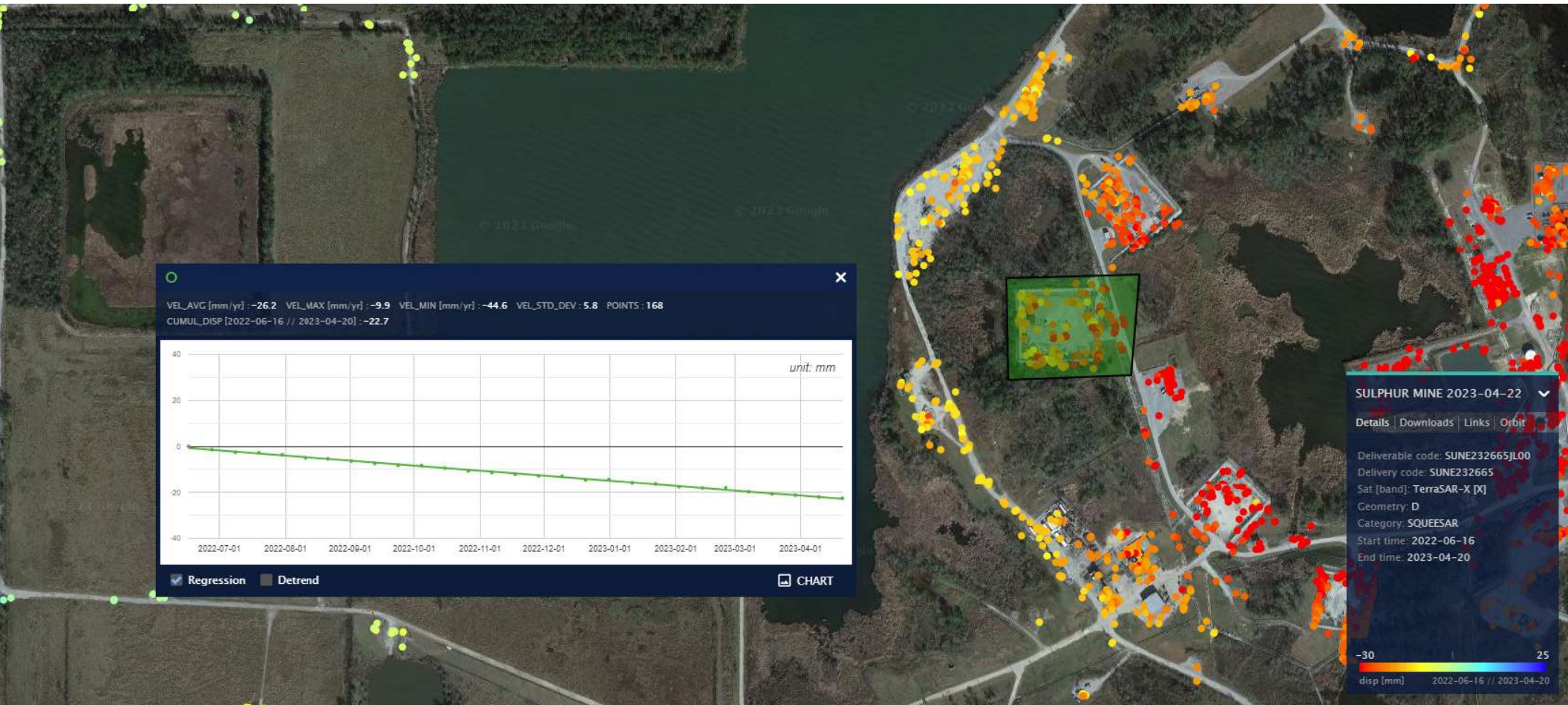
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Continuous Monitoring of Ground Subsidence

6



# PPG 7

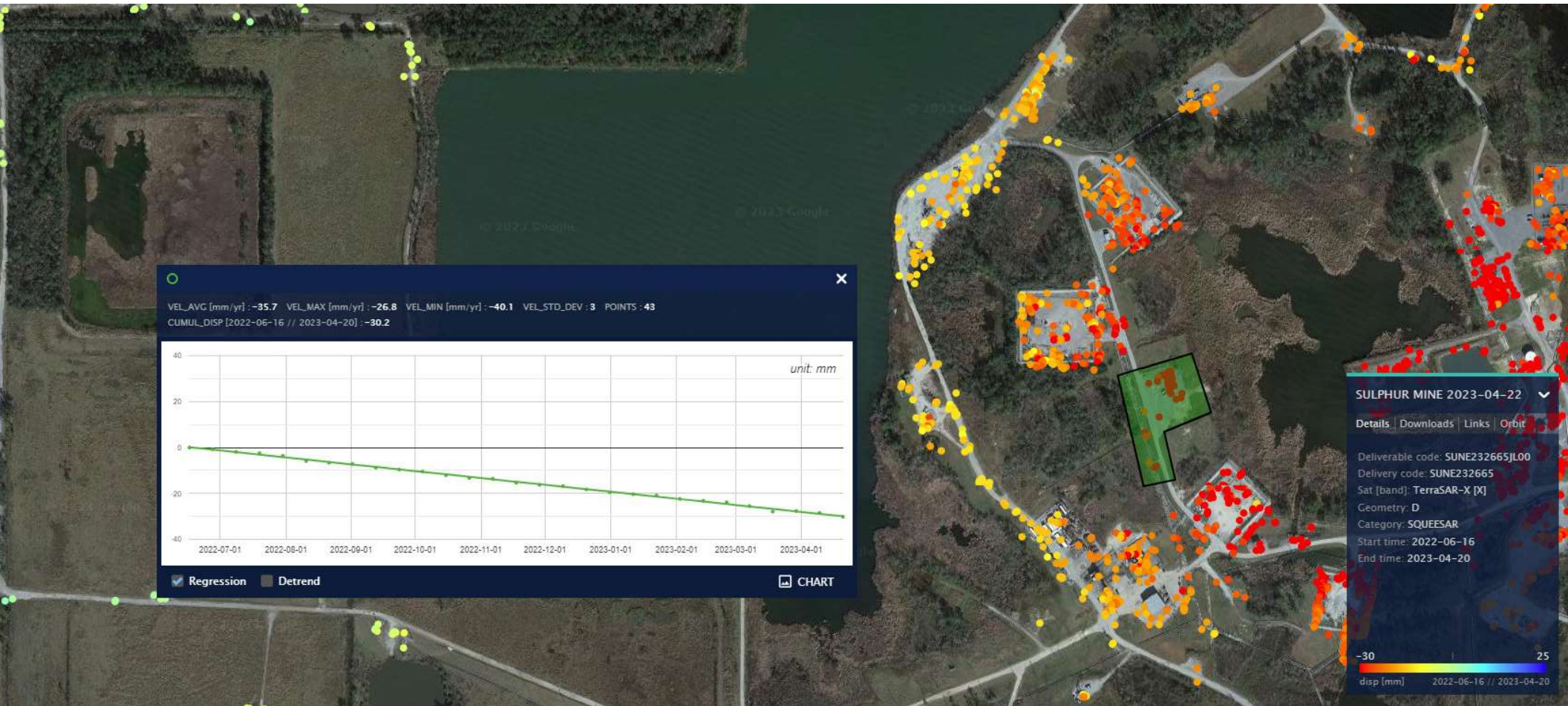


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# PPG 22



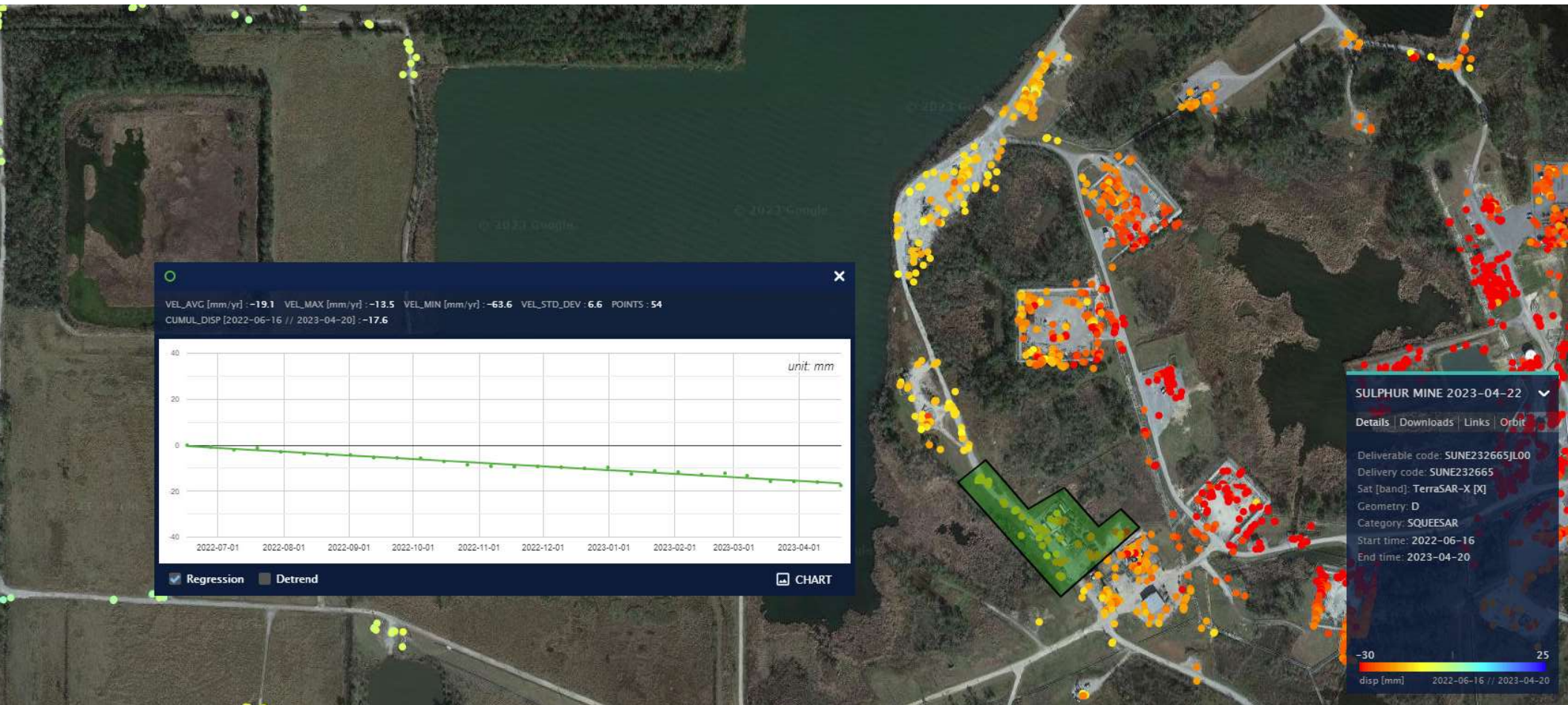
4/24/2023

Continuous Monitoring of Ground Subsidence

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# AOI #1



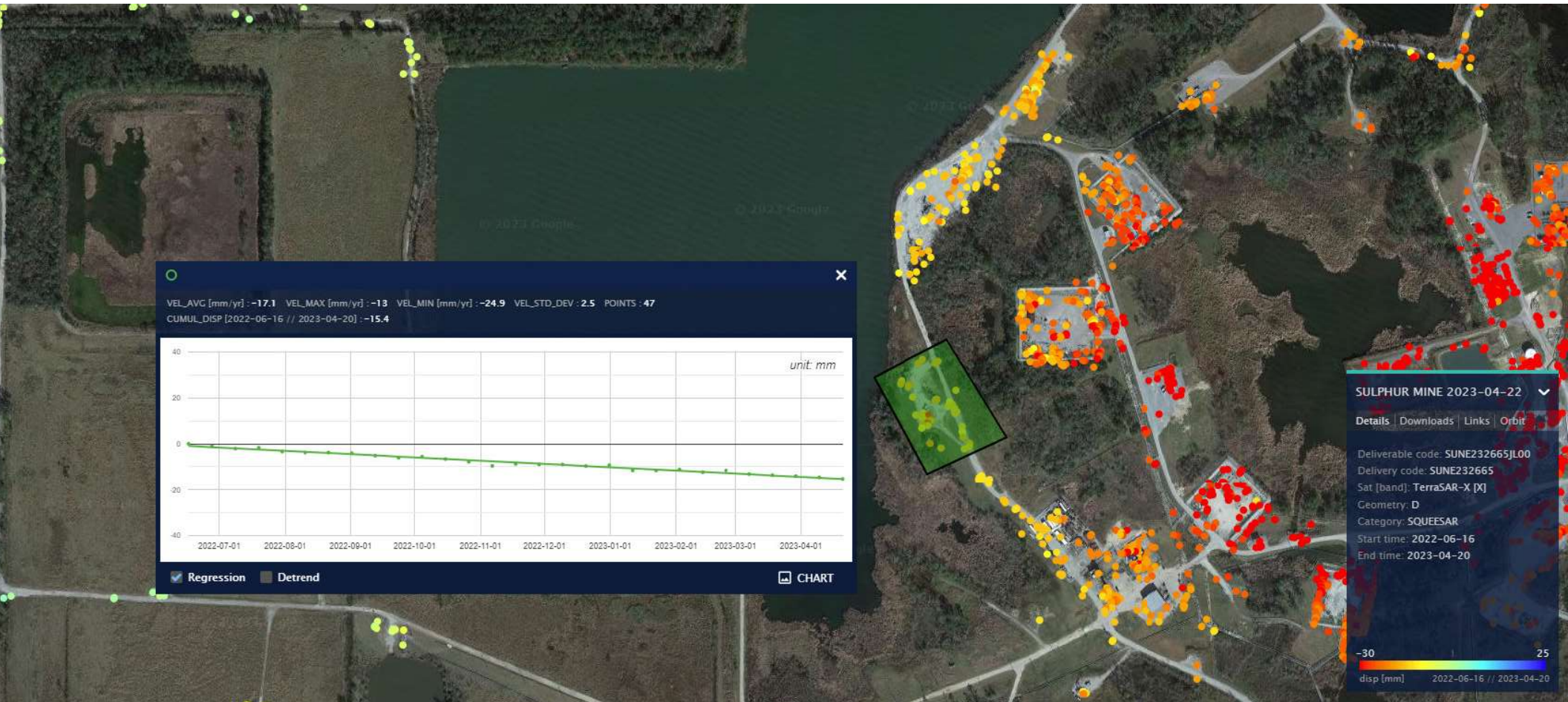
4/24/2023

Continuous Monitoring of Ground Subsidence

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# AOI #2



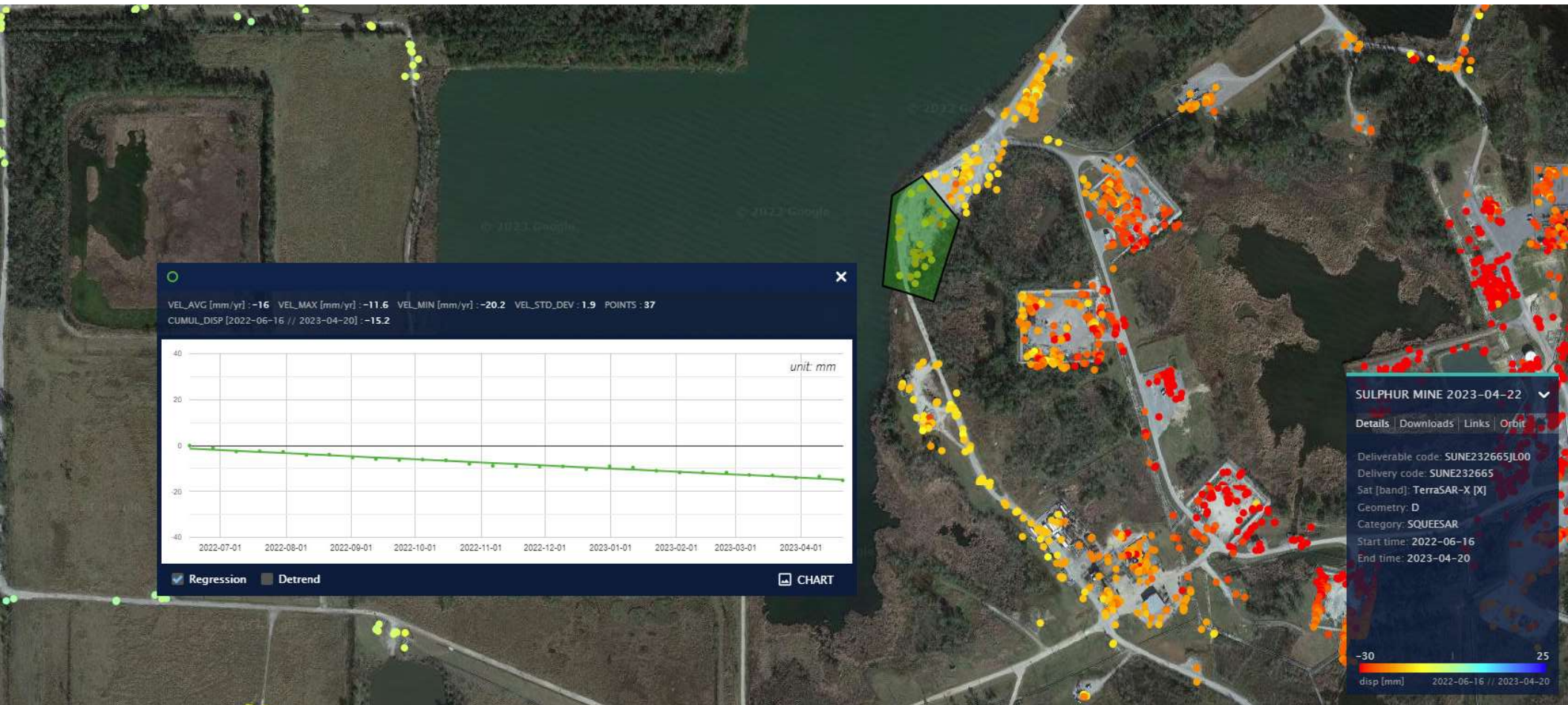
4/24/2023

Continuous Monitoring of Ground Subsidence

10



# AOI #3



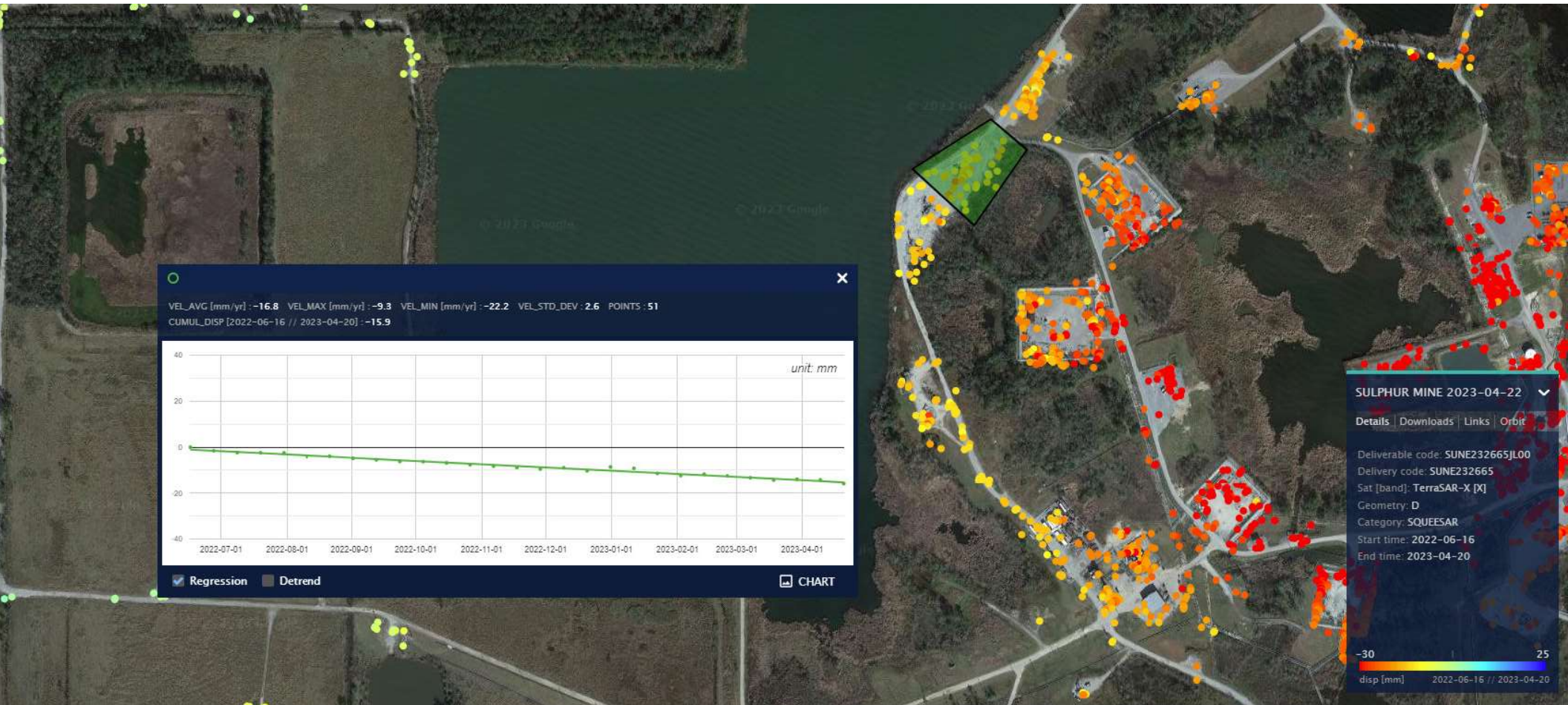
4/24/2023

Continuous Monitoring of Ground Subsidence

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# AOI #4



4/24/2023

Continuous Monitoring of Ground Subsidence

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# TSX/PAZ Constellation Update

## Continuous InSAR Monitoring of Ground Displacement Near Western Caverns and Dome Flank

Sulphur Dome  
Westlake Chemicals

April 22, 2023 Update



Date Signed: April 24, 2023  
Austin, TX

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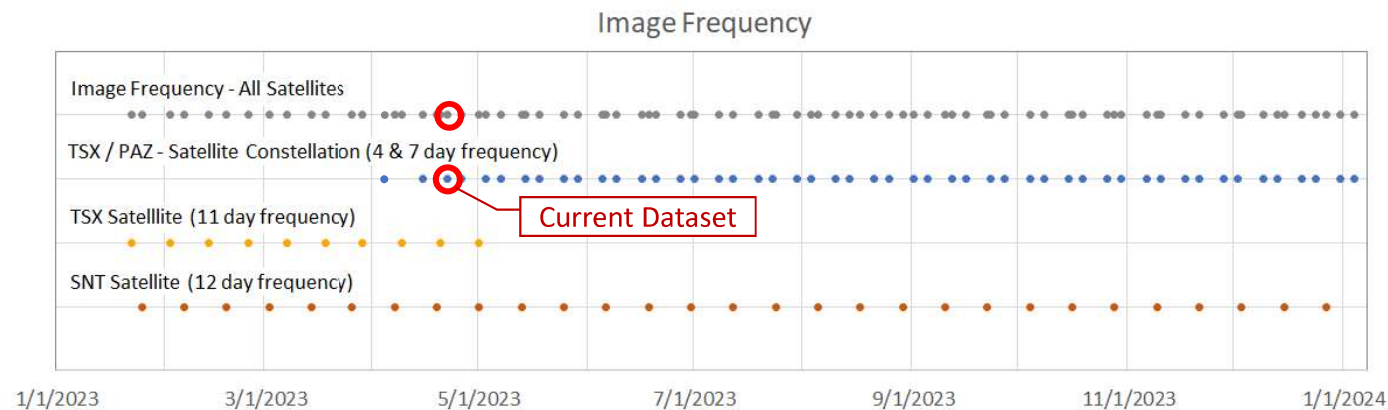
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# TSX/PAZ Constellation – April 22, 2023 Update

# PPG 21



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Continuous Monitoring of Ground Subsidence



# PPG 6

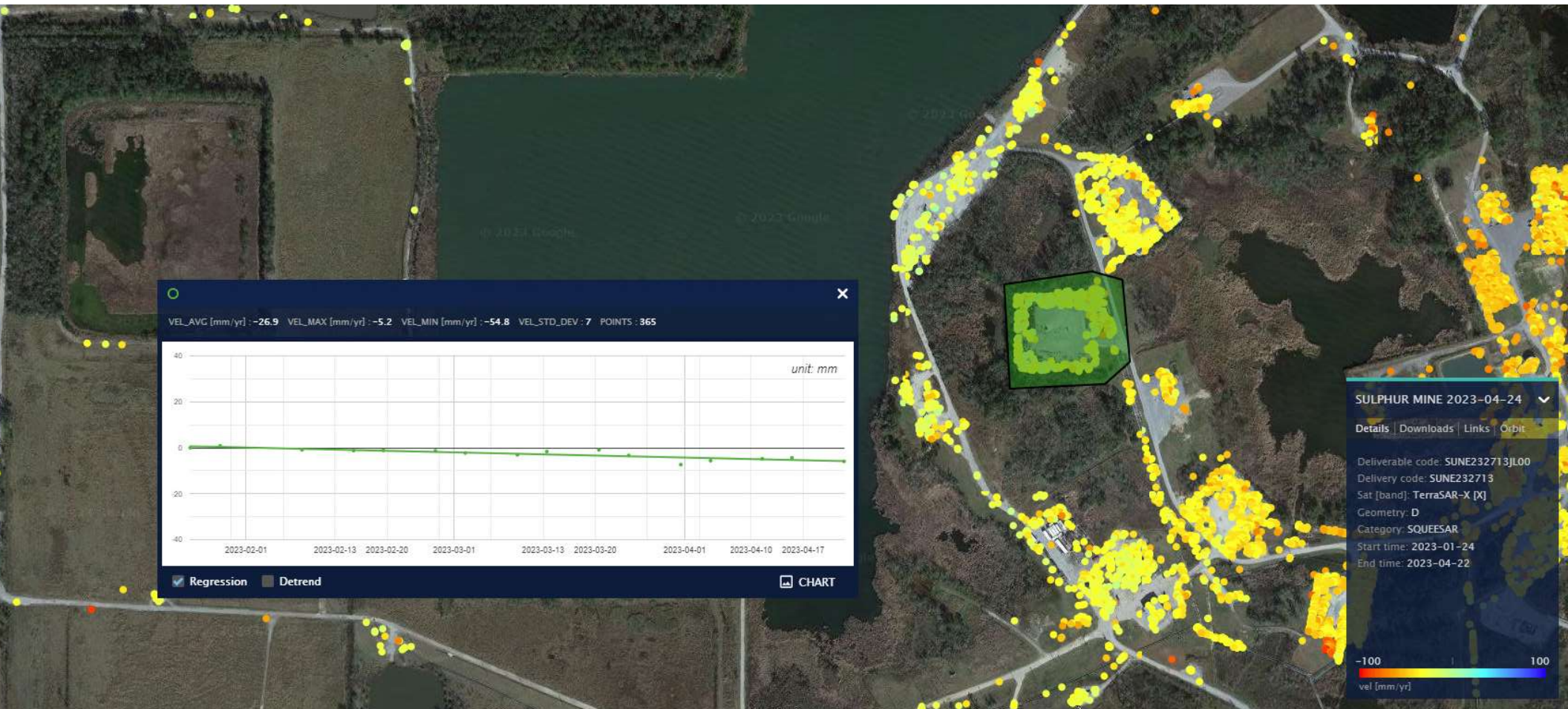


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Continuous Monitoring of Ground Subsidence



# PPG 7



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# PPG 22



4/24/2023

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# AOI #1



4/24/2023

Continuous Monitoring of Ground Subsidence



# AOI #2



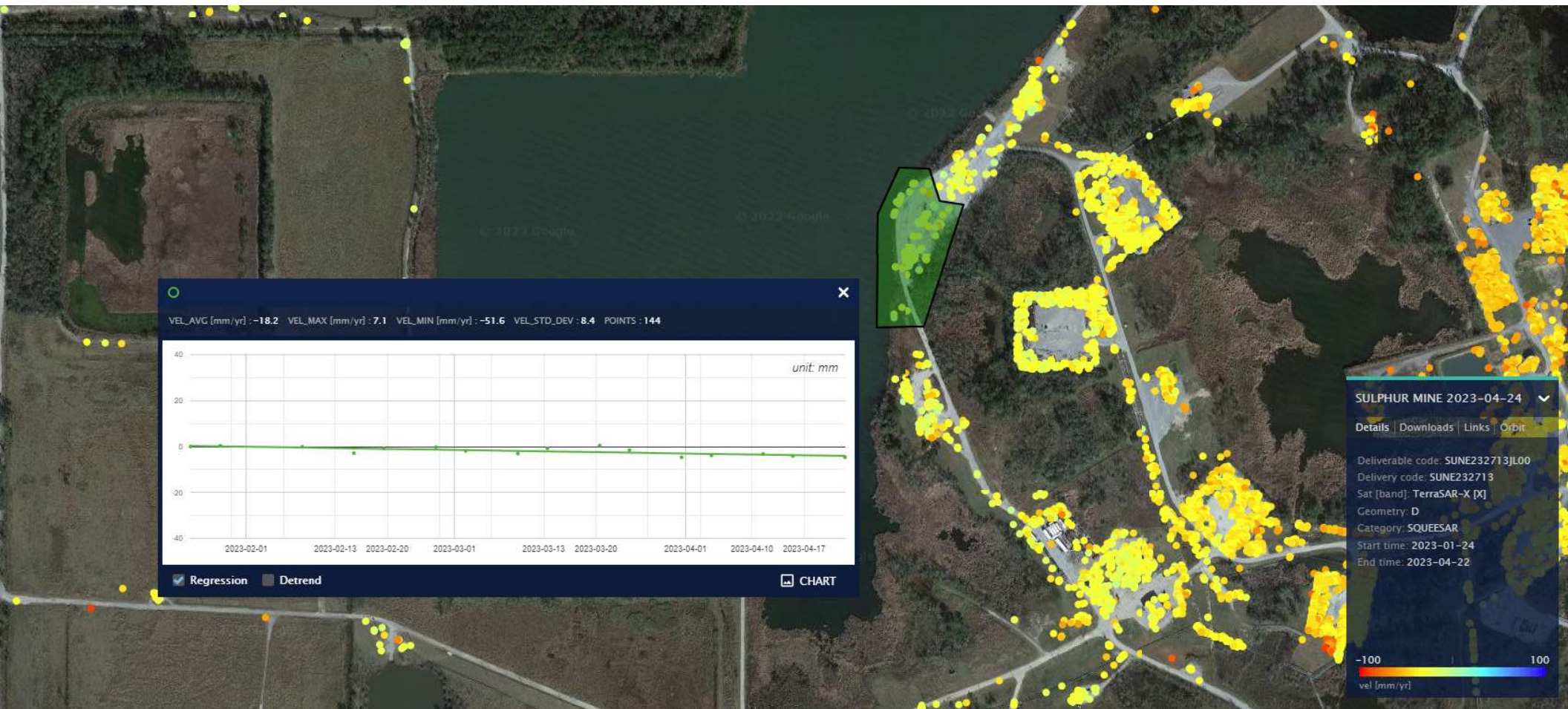
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# AOI #3



4/24/2023

Continuous Monitoring of Ground Subsidence

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# AOI #4



4/24/2023

Continuous Monitoring of Ground Subsidence

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