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Sample Report BASIC

Index

1. Area of Interest – Overview
2. General Geology
3. Urban Analysis
4. Micro Climate
5. Weather Analysis
6. Atmospheric Composition
7. Subsidence

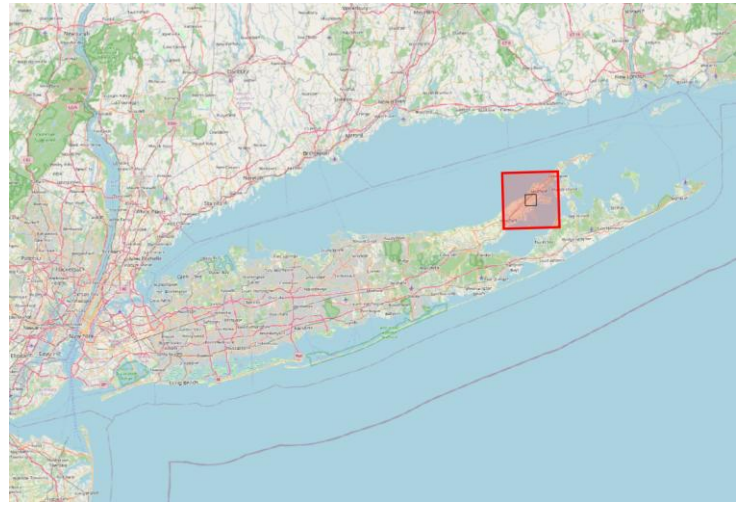
AREA OF INTEREST

Latitude:	41.04270
Longitude:	-72.45548
Hectares	≈ 1.45 ha
Acres	≈ 3.59 acres

City: Peconic | ZIP Code: 11958 | County: Suffolk County | State: New York | Township: Southold



Optical satellite image, 5m res, 2026/05/18; AOI marked red



Corresponding map view; 4 sqm (black) and 25sqm (red) perimeter



Corresponding optical satellite image (2026/05/18), 5x5 sqm perimeter with AOI marked red

GENERAL GEOLOGY

Source: USGS/AASG National Geologic Map Database; Fuller, M. L. (1914). Professional Paper 82 (1:125,000). U.S. Geological Survey



Thin glacial outwash overlies the Harbor Hill Moraine, punctuated by exposures of the Manhasset Formation.

Manhasset Formation: is a geologic unit found primarily on Long Island, New York, and parts of the surrounding region. Here are the key points: Predominantly unconsolidated to semi-consolidated deposits of sand, gravel, and clay, often with layers of lignite (woody organic material). It is not a single solid rock layer but a mix of sediments.

1. Bearing Capacity & Settlement

Unconsolidated sands, gravels, and clays provide variable load-bearing capacity. Clay-rich lenses can compress unevenly, leading to differential settlement and structural cracking.

2. Slope Stability

Where it outcrops along bluffs, the material is prone to slumping and erosion. Excavation without retaining walls and proper drainage risks destabilizing the hillside.

3. Drainage Issues

Sandy layers drain well, but clay lenses trap water, creating perched water tables. This leads to wet basements and hydrostatic pressure, requiring robust waterproofing and foundation drainage.

4. Lignite Concerns

Decaying lignite can create compressible zones and produce acidic groundwater that corrodes concrete and metal foundation elements over time.

5. Radon Potential

The permeable nature of the formation allows soil gas migration—radon testing and mitigation should be considered.

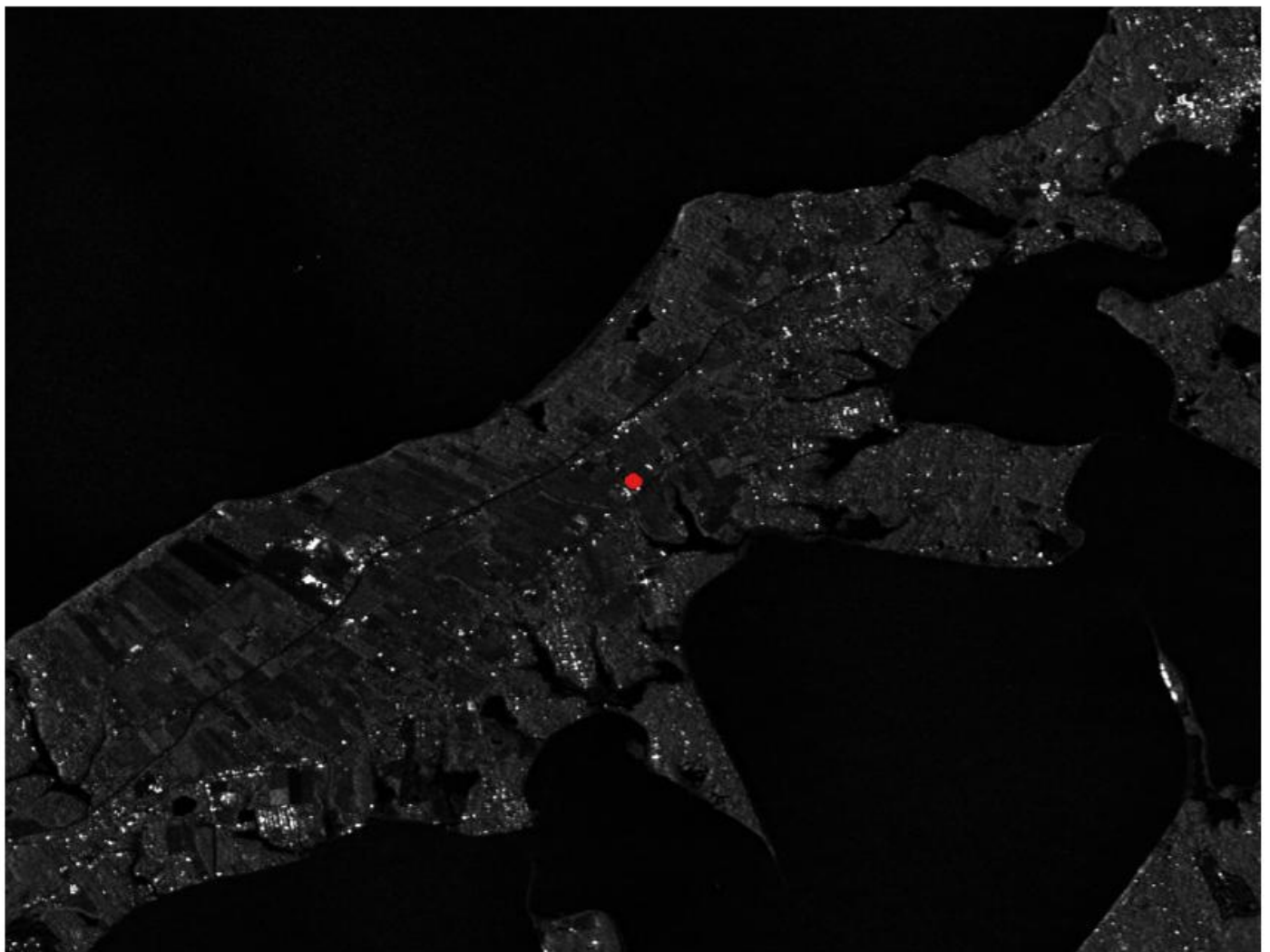
Summary:

Sites on or near outcropping Manhasset Formation demand a thorough geotechnical investigation—beyond a standard home inspection—covering slope stability, drainage, and foundation engineering.

URBAN ANALYSIS

SYNTHETIC APERTURE RADAR

Space-borne radar systems with 10-meter resolution, such as those onboard modern SAR (Synthetic Aperture Radar) satellites, provide highly detailed imagery capable of discerning individual buildings and infrastructure with remarkable clarity. In this application, the radar data is leveraged to compare urban landscapes over time, enabling the detection of newly constructed buildings, demolished structures, and other changes in infrastructure. By analyzing these high-resolution images, one can track urban development patterns, assess growth or decline in specific areas, and gain insights into the evolving character of cities, including density, spatial distribution, and the pace of construction or decay. This approach is particularly valuable for monitoring urbanization,.

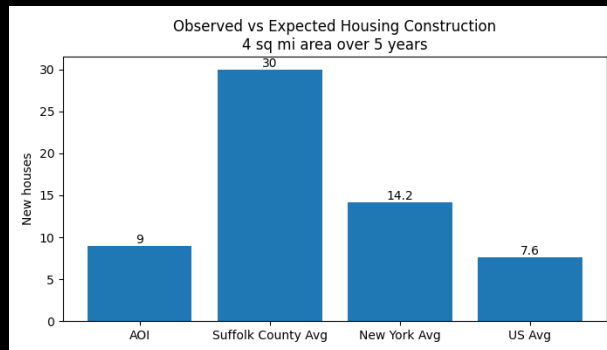


Multi look radar image of a 20 sqm area around the AOI (red) outlining radar signature of infrastructure in 2026.

URBAN ANALYSIS

SYNTHETIC APERTURE RADAR

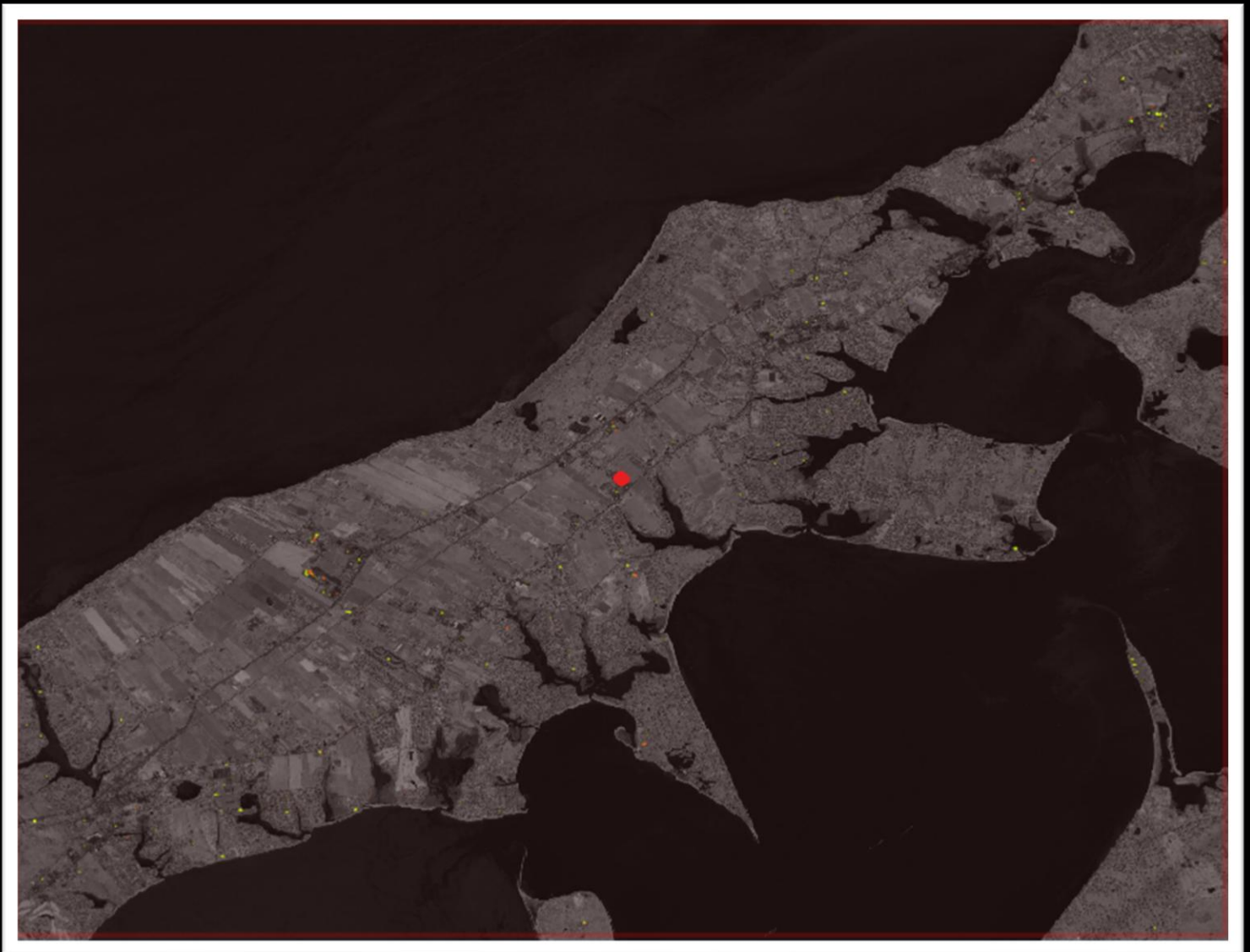
The image at the bottom shows a comparison of multi-look radar images from 2026 compared to 2022, with green indicating newly emerged buildings and red highlighting demolished buildings. The radar information is overlaid on a near-infrared optical satellite image taken on 2026/05/18, revealing only 9 new structures and 5 demolished structures in the area of interest. Notably, the area of interest is below both the county and state averages for new construction, indicating very little change to the infrastructural pattern. For a home buyer, this stability is significant as it suggests a mature, established neighborhood with minimal disruption, reducing risks associated with rapid development (e.g., noise, traffic, or shifting property values). It also implies long-term predictability in terms of amenities, services, and community character.



URBAN ANALYSIS

SYNTHETIC APERTURE RADAR

Below image shows a 20-square-mile box around the AOI, outlining newly constructed buildings (green) and demolished buildings (red) in the period 2021 to 2026, superimposed on a near-infrared image.

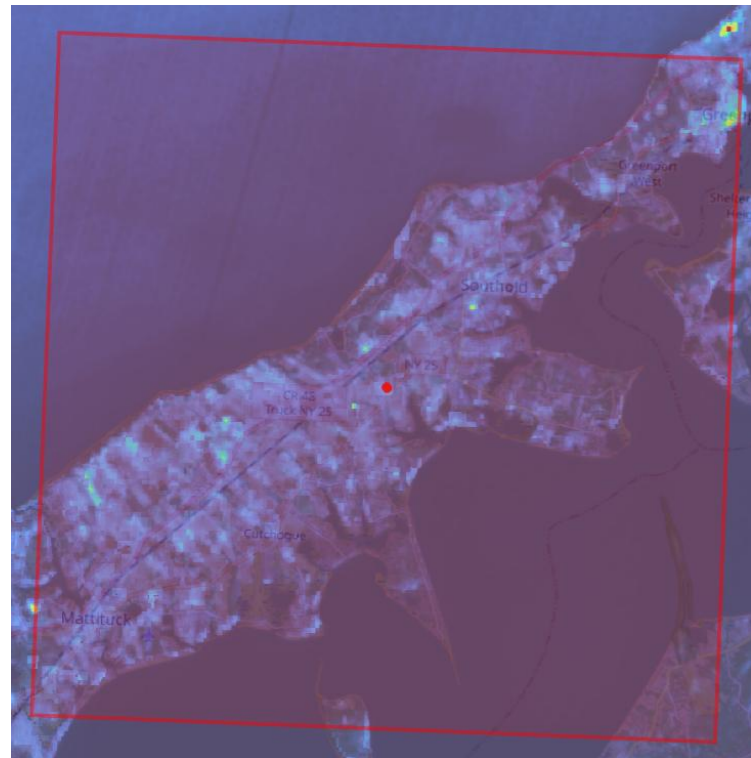
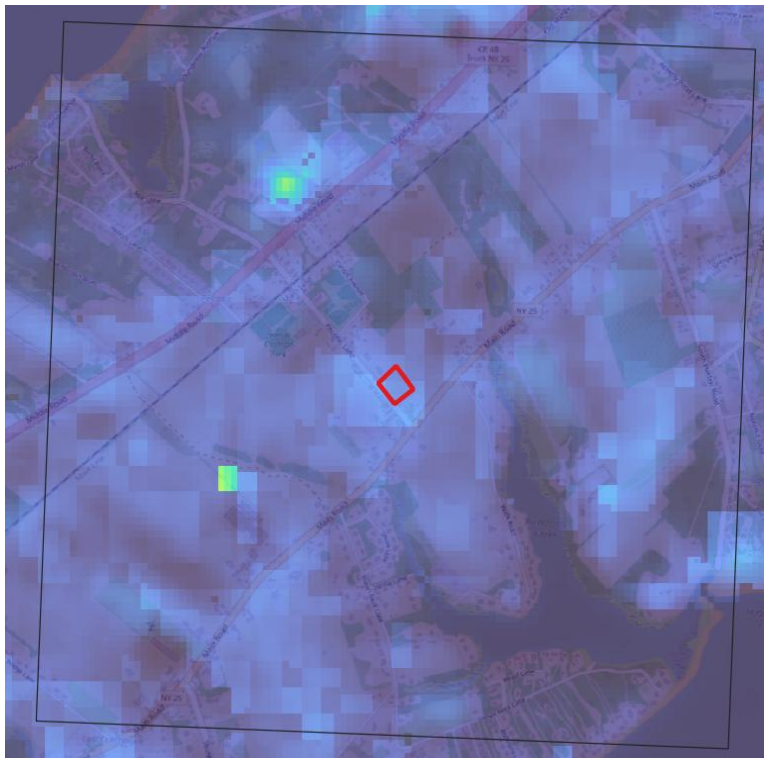


Multi look radar image of a 20 sqm area around the AOI (red) outlining radar signature of infrastructure in 2026

MICRO CLIMATE - WINTER

The below images show space-borne thermal infrared imagery, averaged throughout winter 2025/2026, depicting average surface temperatures. The left image covers a 1x1 mile perimeter around the area of interest, while the right image shows a 5x5 mile perimeter. Notably, the surface temperature of the area of interest deviates by just 1.1% from the average within a 4-square-mile perimeter. In conclusion, there appears to be no significant microclimate pattern present.

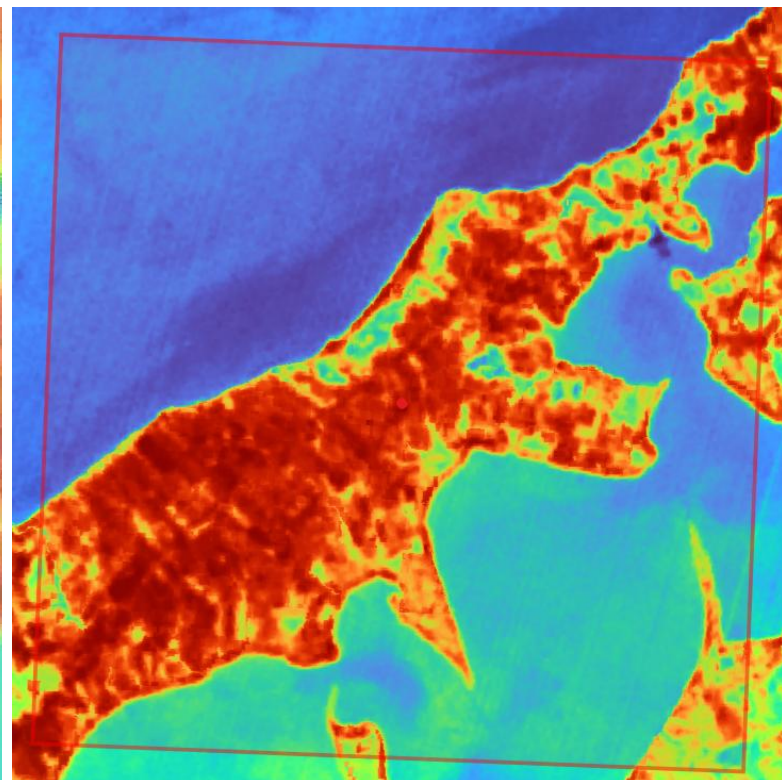
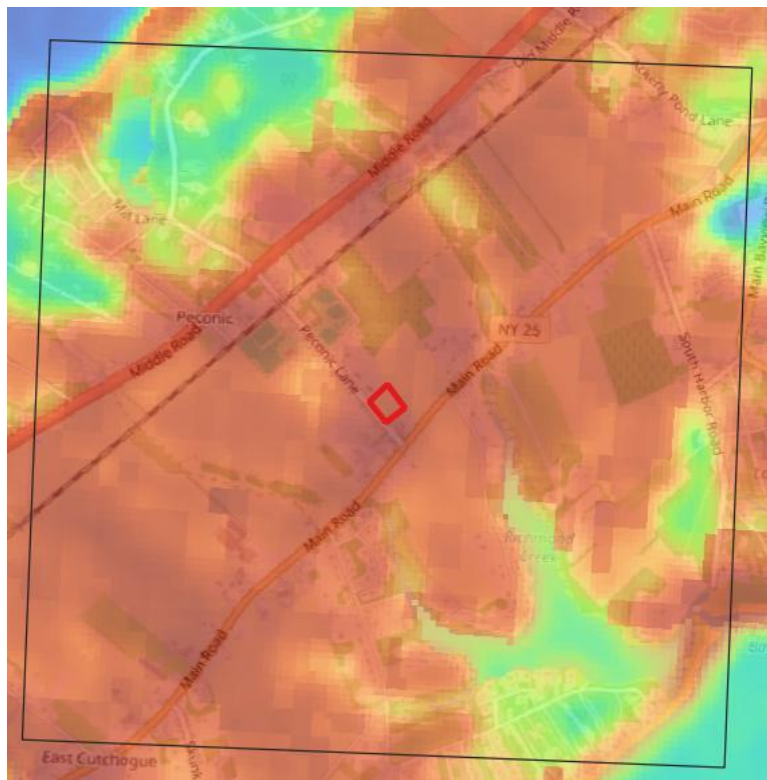
A microclimate refers to the localized atmospheric conditions—such as temperature, humidity, and wind patterns—that differ from the broader regional climate due to factors like topography, vegetation, urban structures, or proximity to water bodies. These variations can significantly impact ecosystems, agriculture, urban planning, and energy use, as they influence everything from plant growth to human comfort. In conclusion, given the minimal temperature deviation observed, there appears to be no significant microclimate pattern present in this area.



Deviation of 4sqm median:
+1.1%

MICRO CLIMATE - SUMMER

Analogous to the previous page, space-borne thermal infrared images of average surface temperatures throughout summer 2025 show that the area of interest has an average temperature 2.1% above the regional average, further highlighting the absence of a significant microclimate.

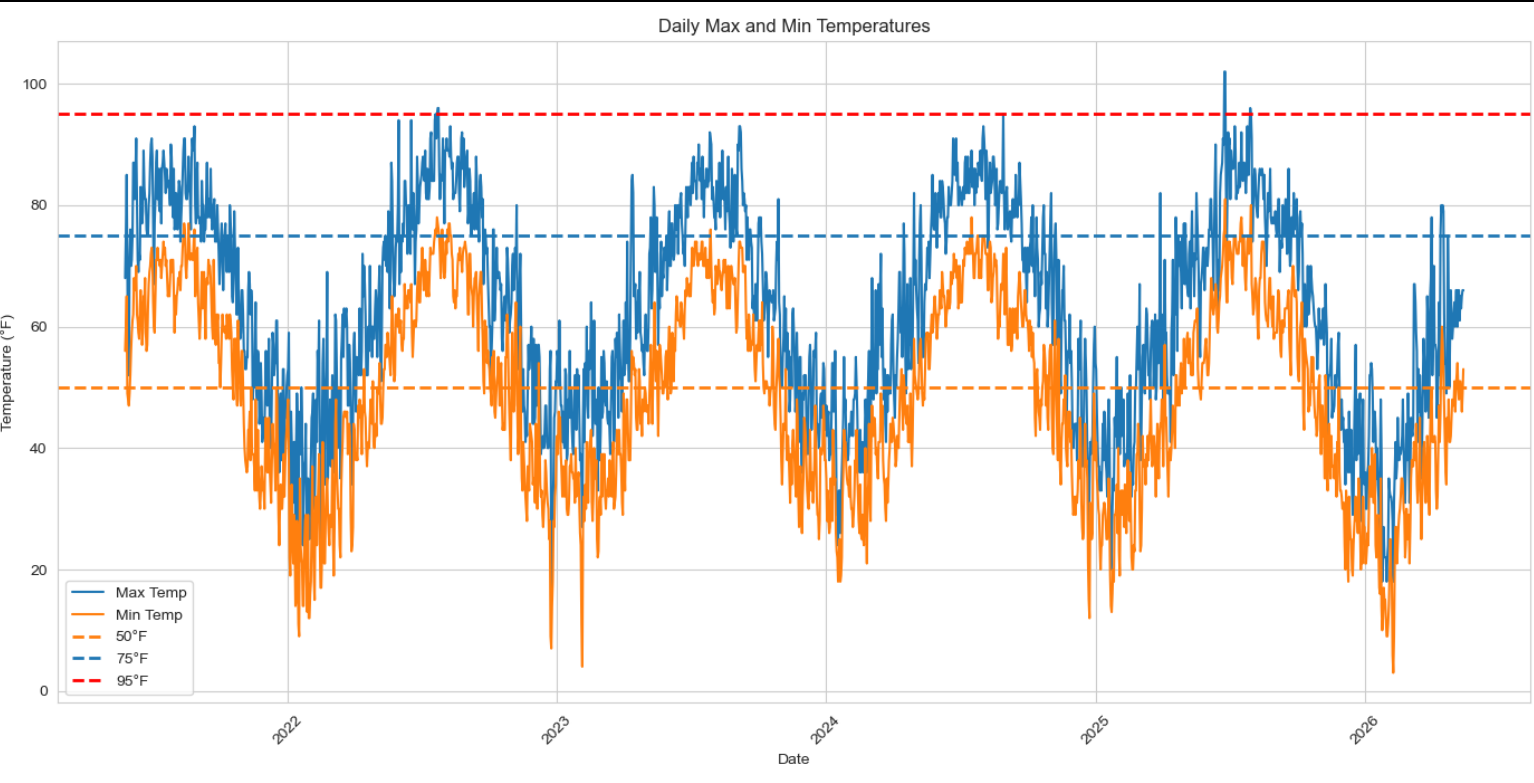


Deviation of 4sqm median:
+2.1%

5 year

Temperature

A 5-year weather report with daily temperatures helps identify climate trends, such as increasing extreme heat days (>95°F), heating needs (below 50°F), and AC demand (>70°F), revealing climate change impacts and enabling cost estimates for heating/cooling systems. This data ensures informed decisions on energy efficiency and long-term property suitability.



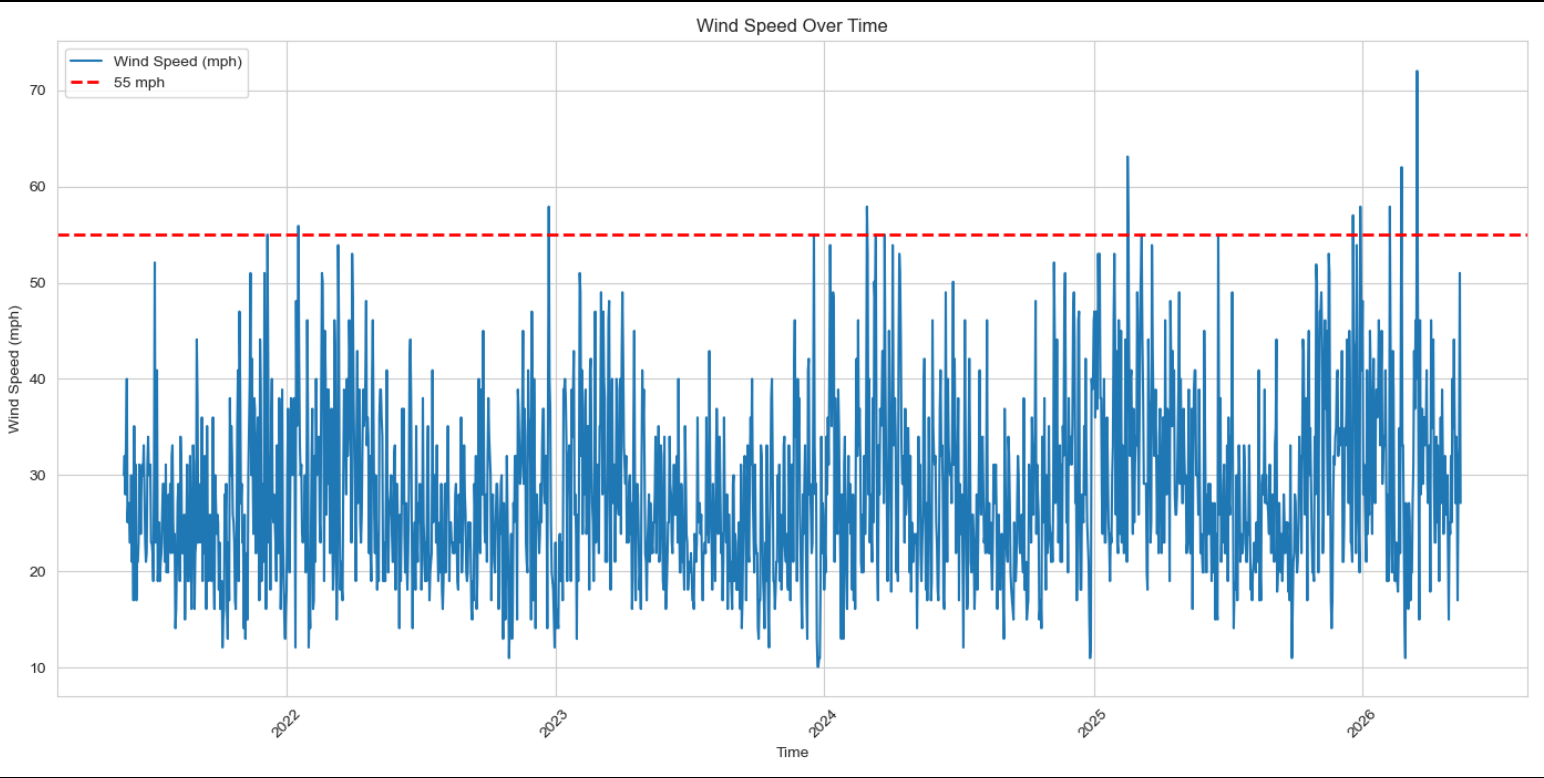
Year	Days with Tmax ≥ 95°F	Days with Tmax ≥ 75°F	Days with Tmin ≤ 50°F
2022	4	119	198
2023	0	112	204
2024	1	131	192
2025	4	117	190
2026*	1	25	130

Source: NOAA (National Centers for Environmental Information – National Oceanic and Atmospheric Administration)

5 year

Wind/Storm

A graph of sustained maximum wind speeds highlights days exceeding 55 knots (damaging winds), helping assess structural storm risks and track climate change trends over time. This data enables buyers to estimate potential damage risks and plan for resilient construction or insurance needs.

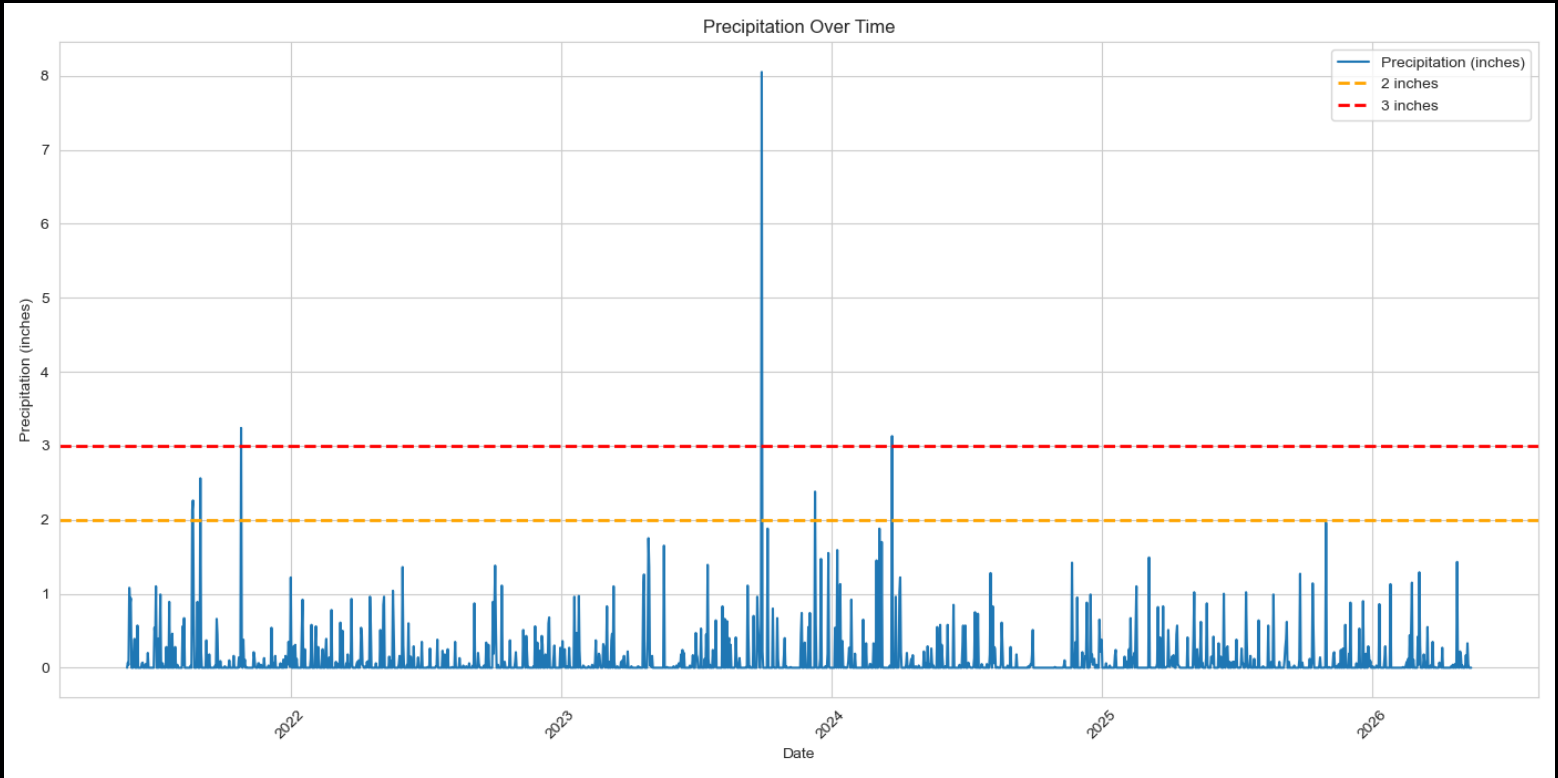


Year	Days with WSF5 ≥ 55 kt
2022	2
2023	1
2024	3
2025	6
2026*	4

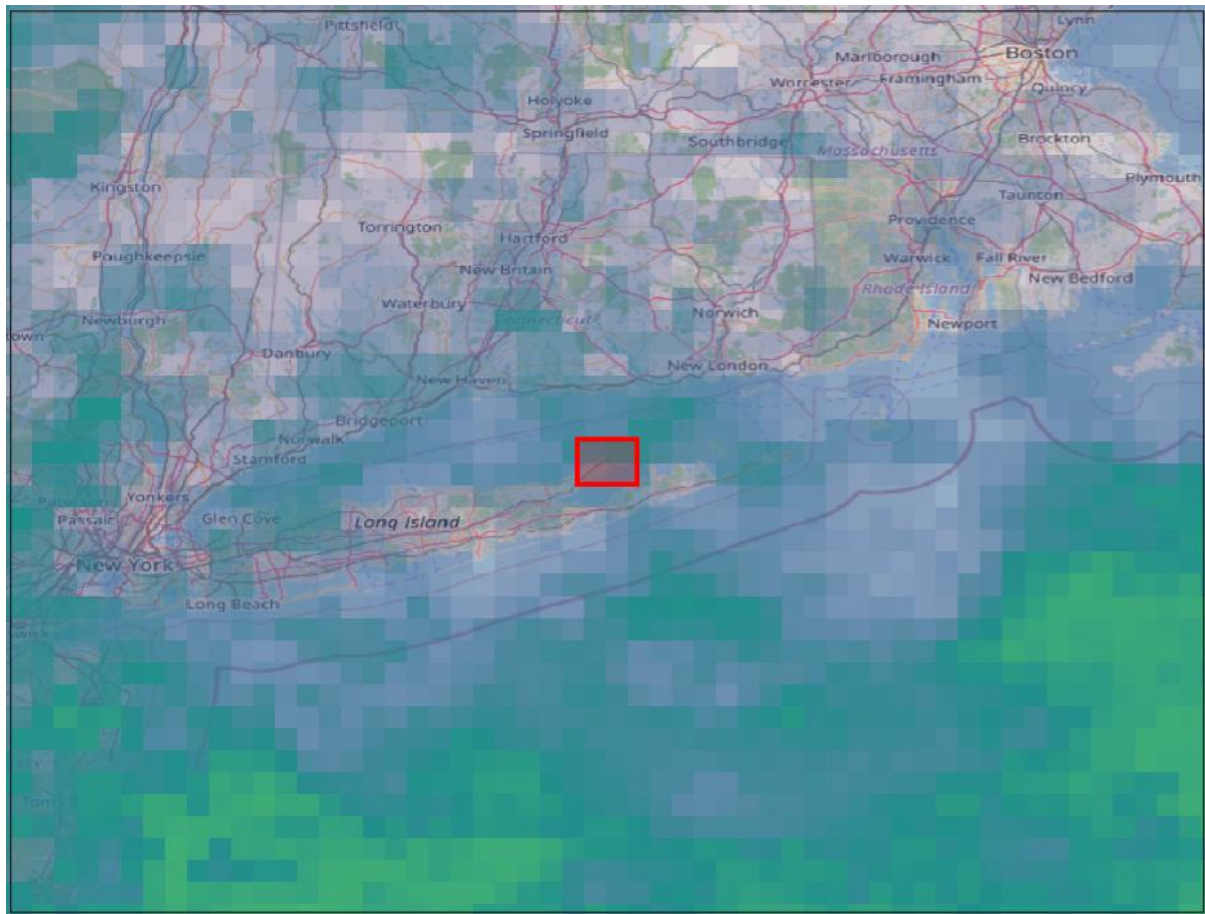
5 year

Rain/Precipitation

A 5-year precipitation report highlighting days with 2+ or 3+ inches of rainfall helps identify flood risks, drainage challenges, and climate trends (e.g., increasing extreme rainfall events). This data allows buyers to assess water management needs and potential long-term impacts on land stability or infrastructure.



Year	Days with 2" < PRCP < 3"	Days with PRCP > 3"
2022	0	0
2023	1	1
2024	0	1
2025	0	0
2026*	0	0

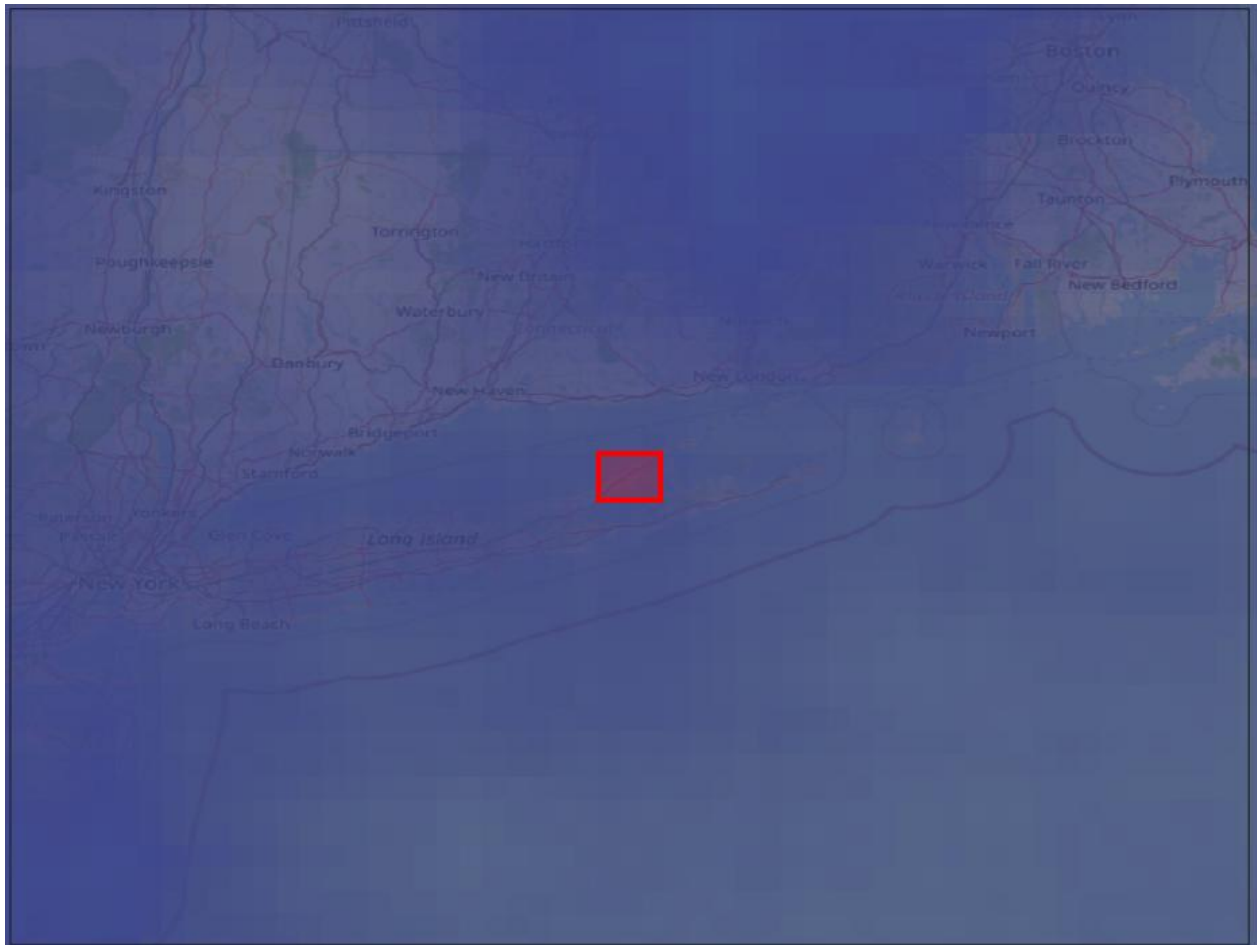


min

max

AEROSOL Index 2025-26

Aerosols are microscopic solid or liquid particles suspended in the air, originating from natural sources (e.g., dust, sea salt, volcanic ash) or human activities (e.g., industrial emissions, vehicle exhaust, wildfires). They pose severe health risks by penetrating deep into the lungs and even entering the bloodstream, causing or exacerbating respiratory diseases (asthma, bronchitis), cardiovascular issues, lung cancer, and stroke, with fine particles ($PM_{2.5}$) linked to millions of premature deaths annually; some aerosols also influence climate by scattering or absorbing sunlight.

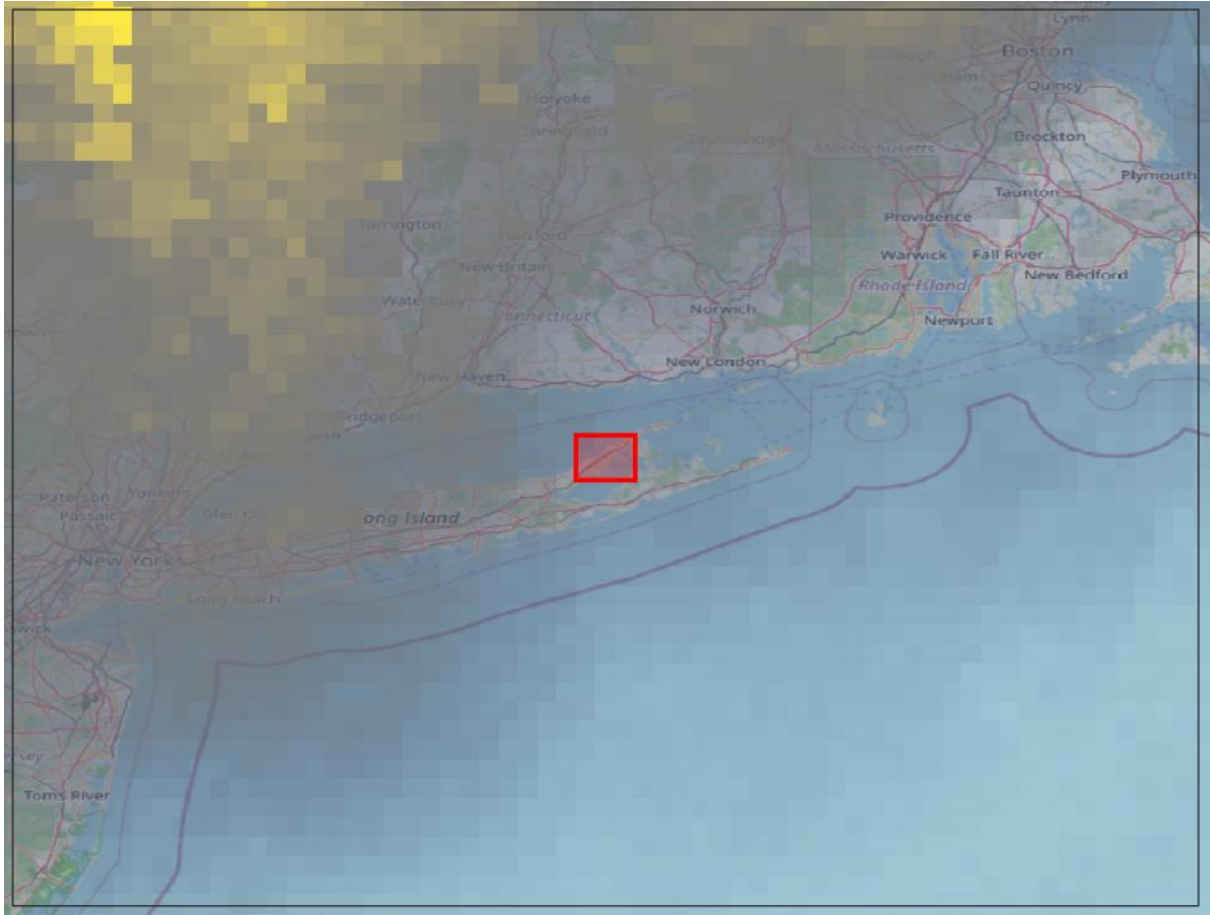


min

max

OZONE 2025-26

Ozone (O_3) is a gas that exists in two atmospheric layers: the stratosphere (where it forms a protective layer shielding Earth from harmful UV radiation) and the troposphere (where it acts as a harmful pollutant). At ground level, ozone is a secondary pollutant created by chemical reactions between nitrogen oxides (NO_x) and volatile organic compounds (VOCs) under sunlight. It irritates the respiratory system, reduces lung function, exacerbates asthma and COPD, and causes chronic respiratory diseases, cardiovascular issues, and lung inflammation, with long-term exposure linked to premature death; children, the elderly, and those with pre-existing conditions are most vulnerable.



min

max

NITROGEN DIOXIDE 2025-26

Nitrogen Dioxide (NO_2) is a toxic, reddish-brown gas primarily emitted from combustion processes, such as vehicle exhaust, power plants, and industrial activities. As a key component of urban air pollution, NO_2 reacts with sunlight and other pollutants to form ground-level ozone and fine particulate matter ($\text{PM}_{2.5}$), further degrading air quality. Exposure to NO_2 irritates the respiratory tract, worsens asthma, bronchitis, and COPD, and increases the risk of respiratory infections, heart disease, and premature death. Long-term exposure is particularly harmful to children, the elderly, and individuals with pre-existing respiratory or cardiovascular conditions, as it impairs lung development and function while contributing to systemic inflammation.

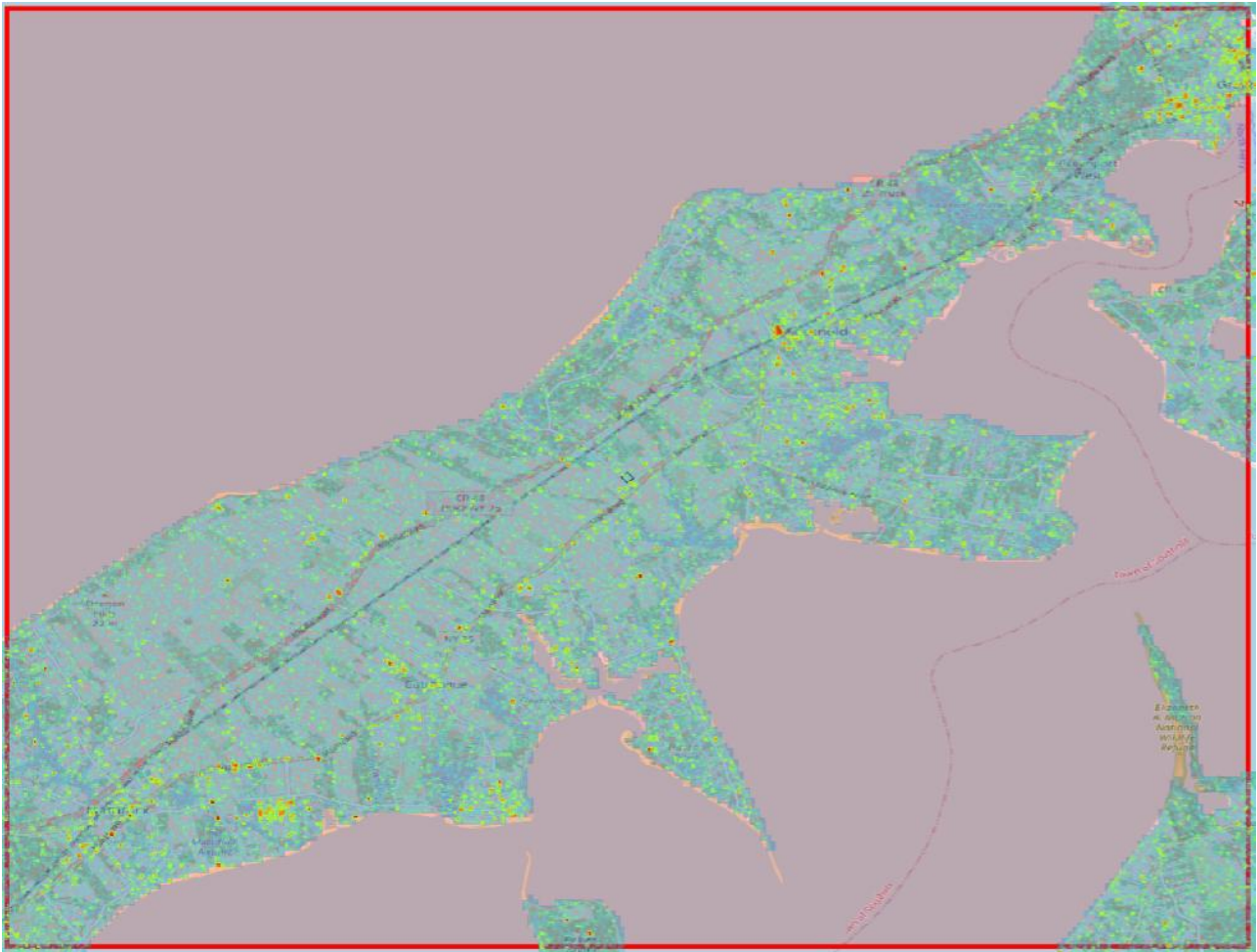


pos

neg

SUBSIDENCE MAP, 4sqm

This subsidence map, generated using spaceborne radar images from 2021 to 2026, visualizes ground sinking—a gradual or sudden lowering of the Earth's surface due to soil compaction, groundwater extraction, mining, or natural geological processes. Subsidence is critical to monitor because it can damage building foundations, crack roads, and disrupt infrastructure, leading to costly repairs, reduced property values, and safety risks. For homebuyers, developers, and urban planners, understanding these patterns helps avoid high-risk areas and ensure long-term stability.



pos

neg

SUBSIDENCE MAP, 20sqm

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