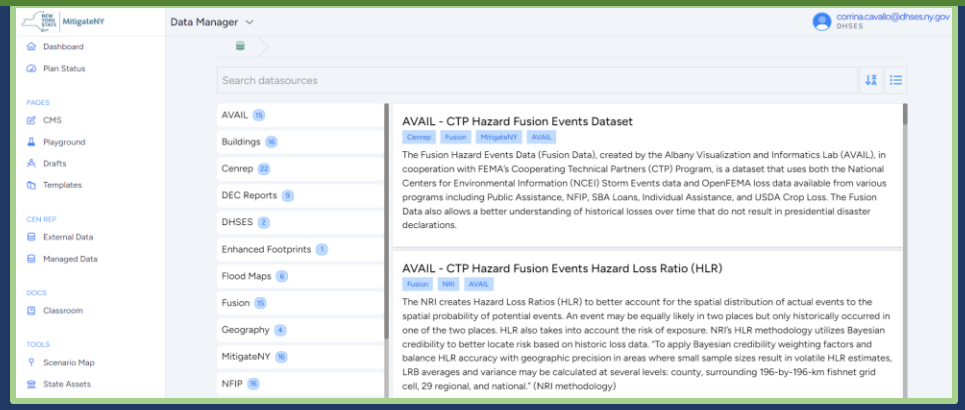
NEW YORK STATE | Homeland Security and Emergency Services

BUILDING INFORMATION AND LANDUSE DATASET (BILD)

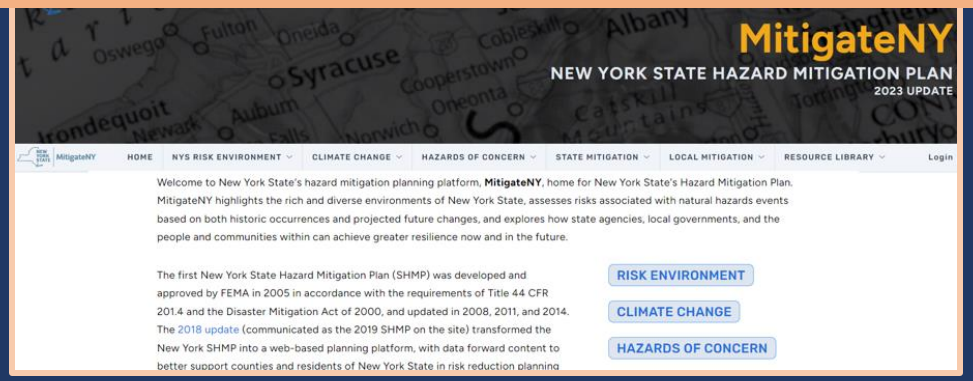
MitigateNY: Multi-Agency Engagement Meeting

Platform Ecosystem

Central Data Repository (CenRep)



State Hazard Mitigation Plan (SHMP)

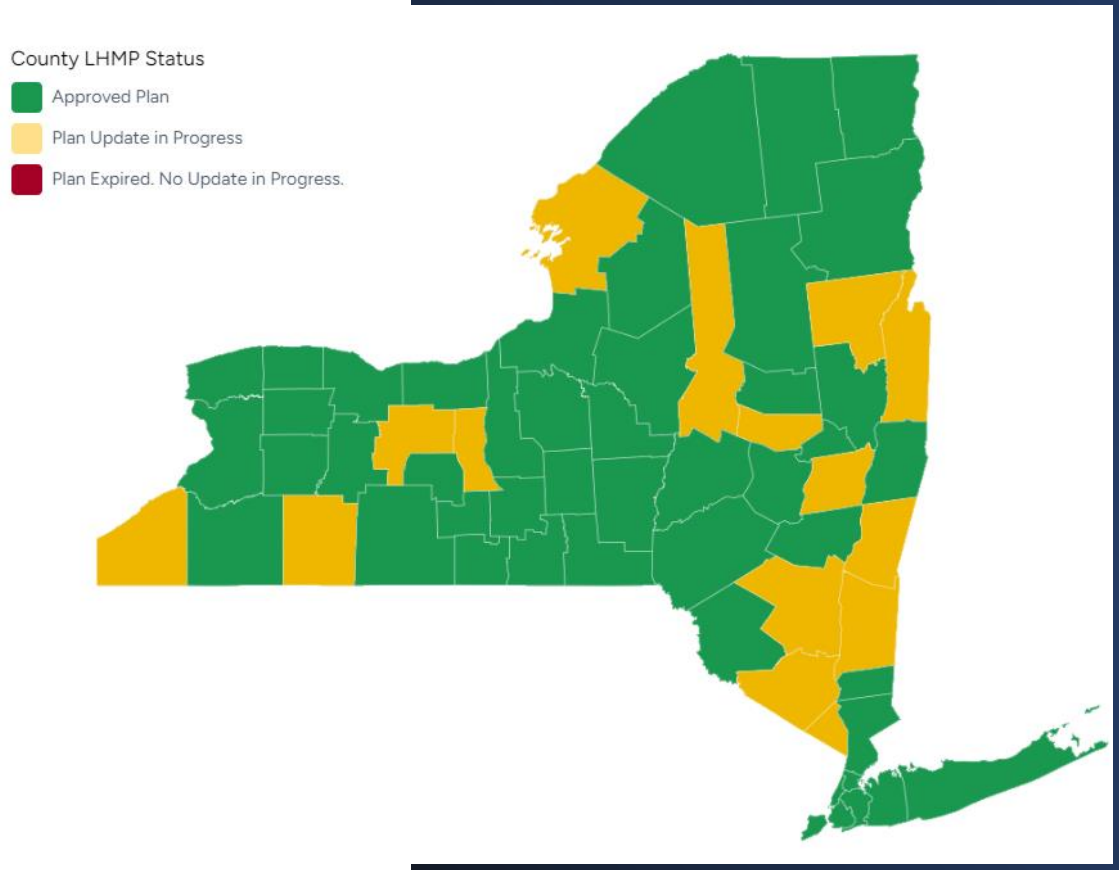


Local Hazard Mitigation Plans (LHMP)

MitigateNY Platform and Program Priorities

Provide all communities a dynamic system that improves the planning process and the quality and utility of the resulting hazard mitigation plan

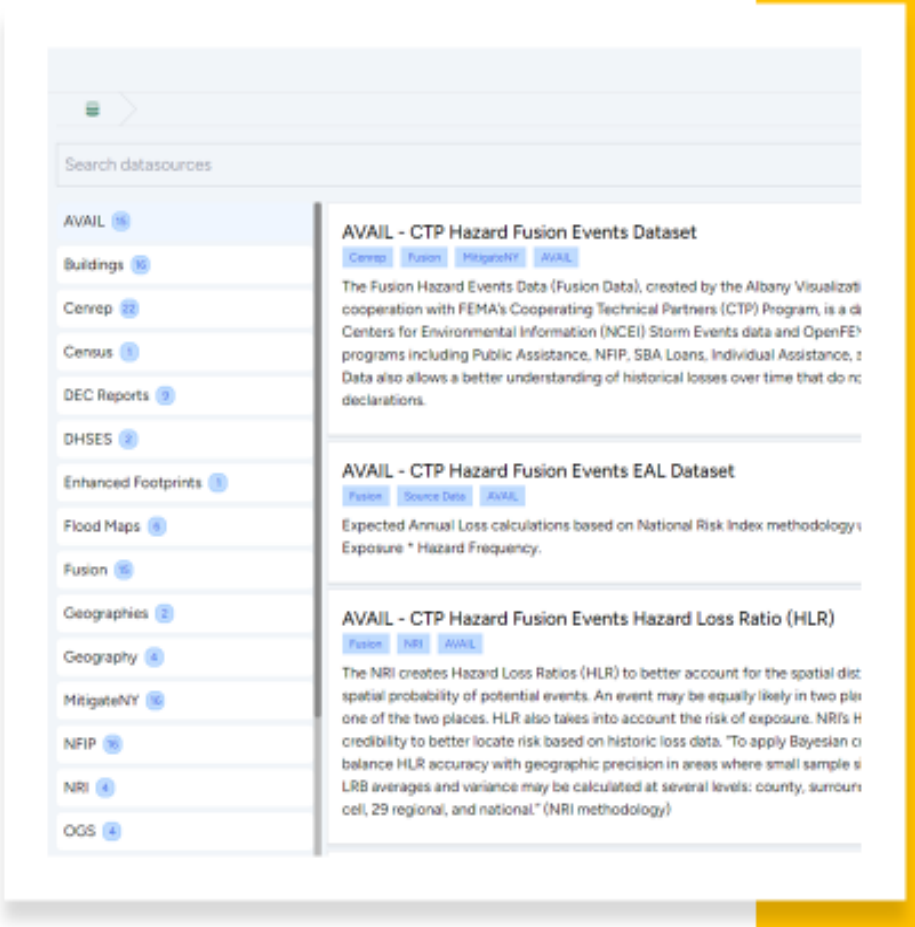
- All counties in New York State have a current Local Hazard Mitigation Plan or are in-progress of an update
- Many will transition to MitigateNY in the next 5 years
- DHSES to provide beta testing and technical assistance



Central Data Repository (CenRep)

Web-based data warehouse and management system

- Stand-alone platform that houses and updates **externally sourced** and **user-generated** data
- Users can create and export custom data visualizations and digital content
- Eliminates the need for expensive data discovery and processing
- Dashboards will provide comparative data analysis for multiple geographies/plans



2023:
- Data and visualizations finalized for SHMP regulatory update

2024:
- Design overhaul
- Improved user interface & experience (UI/UX)
- Data Management Plan finalized
- Data entry capabilities enhanced

2025:
- Expectation of multi-community usership
- User-guide and tutorials developed

Building Information and Landuse Dataset (BILD)

One of several unique, custom datasets included in the CenRep

Initiated in 2019 to support assessment of state-owned assets during SHMP planning process

Expanded to support a broader need statewide and locally

Included and **funded** with the scope of work for the state hazard mitigation plan and the continued development of the MitigateNY platform

Must be **collaborative** for sustainable value:

Convene Buildings Technical Work Group to inform 2024 BILD update

Objectives of the Buildings TWG

Create Awareness – Share Out

Ensure understanding and ground truthing of data processing
- Consult technical experts for review

Ensure availability of data for use, update, and analysis by all agencies

Discovery and Feedback

Gather information about data and operations to consider for inclusion

Ensure consistent open feedback loop during future development

Facilitate Statewide Adoption

Identify users, use-cases, opportunities to integration – state and local

Identify next steps for enhancement, ownership, and maintenance

Minimize Duplication – Maximize Coordination

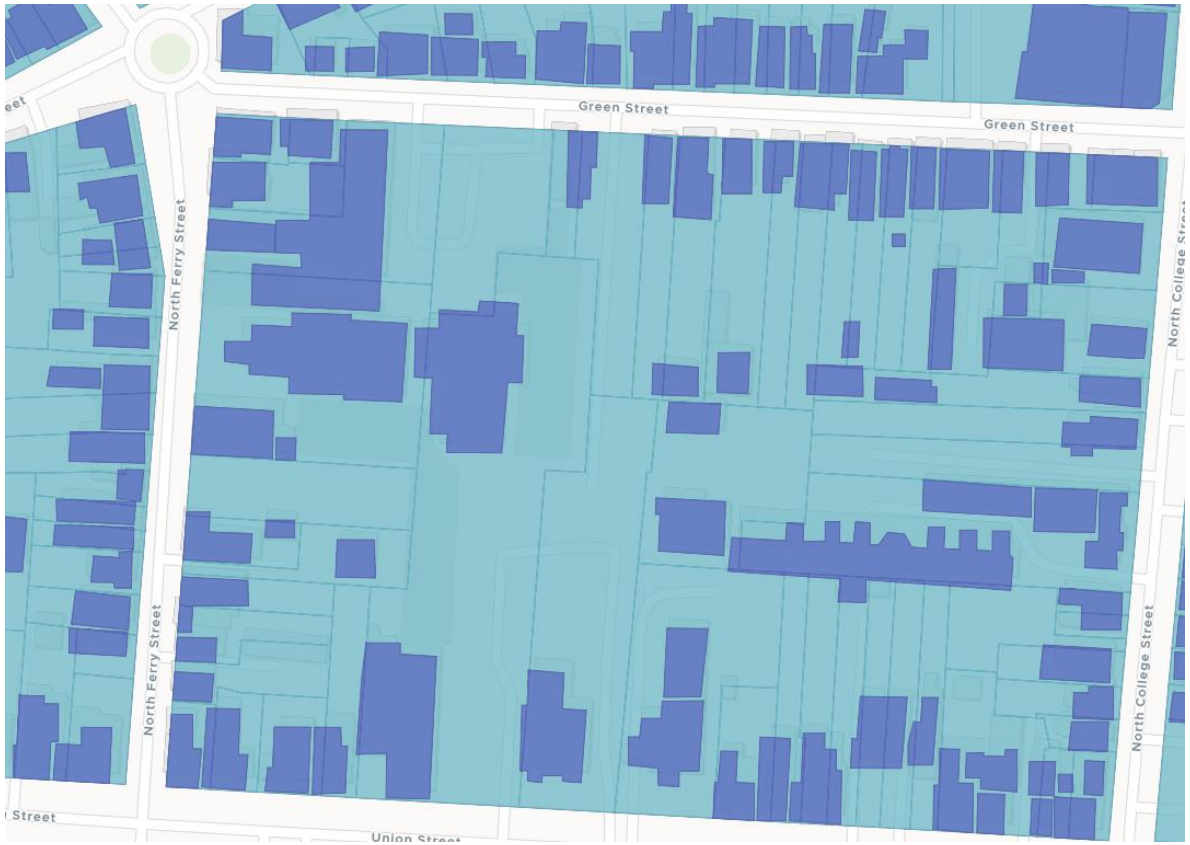
Ensure overlapping needs and future projects across state agencies are considered

Shared effort towards a common process = higher value for all

BILD – Buildings Information and Landuse Dataset

Terminology

- **Polygons** are geometric shapes which show the boundaries of an area such as tax parcels or building footprints.
- **Attributes** are the data fields available for each polygon, which can be viewed in a table format. The attributes are the column names for the table.
- **Parcels** are polygons where boundaries delineate ownership or landuse type for property tax and zoning purposes. Parcel attributes include assessed value and property classes.
- **Footprints** A building footprint is the border of a building drawn along the exterior walls, to create a polygon, representing the total area of the building. It usually excludes non-building facilities such as parking lots and streets and provides a better representation of spatial characteristics.



Map showing footprints (purple) inside tax parcels (teal with blue outlines)

BILD Data Format

The BILD format includes footprint polygons with associated attributes from various datasets

Polygons

COUNTY_NAME	MUNI_NAME	YR_BLT	SQ_FT	SQFT_LIVING	NBR_BEDROOMS
Chautauqua	Arkwright	1928	0	2972	5
Chautauqua	Arkwright	null	0	null	null
Chautauqua	Arkwright	1996	0	1225	3
Chautauqua	Pomfret	1987	0	480	1
Chautauqua	Pomfret	1987	0	480	1
Chautauqua	Pomfret	1987	0	480	1
Chautauqua	Arkwright	1999	0	1872	3
Chautauqua	Arkwright	1992	0	1280	3
Chautauqua	Arkwright	1928	0	1056	2
Chautauqua	Arkwright	null	0	null	null
Chautauqua	Arkwright	null	0	null	null

Attributes

BILD Inputs

Which building footprints dataset provides the most comprehensive coverage?

- Quantity (# of buildings)
- Quality (% of buildings which do not overlap more than one parcel)

Which attributes does each dataset offer for enrichment of footprints?

The following footprints datasets were analyzed:

- NYS ITS Buildings
- Microsoft Building Footprints
- FEMA USA Structures (Oakridge National Labs)
- OpenStreetMap
- Daylight
- CIESIN

BILD Input Assessment

- **Quantity: NYS Buildings** and **Daylight** offer the most coverage by both count and acreage.
- **Quality:** Daylight has better quality (less parcel overlap) than NYS Buildings
- **CIESIN** offers additional enrichment attributes of interest, e.g., roof type.
- All datasets are updated regularly, except for CIESIN. The New York State GIS Program Office (NYSGPO) has taken over the curation of the polygon dataset.

Dataset	Count	Acreage
NYS Buildings	6,765,368	300,764
Daylight	6,333,108	295,780
CIESIN	5,546,833	255,854
FEMA Structures	5,015,975	282,199
Microsoft	4,959,725	279,257
OSM	4,106,784	202,733

BILD Current Status: Inputs and Outputs

- BILD footprints (polygon geometries) are from **OpenStreetMap (OSM)** and **Daylight.**
- BILD footprint attributes are from **NY State Tax Parcels, Daylight**, **CIESIN*** and **OpenStreetMap** building footprints.

Dataset	Polygons Included	Attributes Included
NYS Buildings	N	N
Daylight	Y	Y
CIESIN	N	Y*
FEMA Structures	N	N
Microsoft	N	N
OSM	Y	Y
NYS Tax Parcels	N	Y

*CIESIN data roof-type attribute will be added soon

BILD Attributes

The data currently has 28 attributes from **buildings** and **tax parcel data** including replacement value, property class, and others, and will continue to be enhanced with others.

The BILD data structure can document specific information and properties about footprints in perpetuity

Attribute	Descriptive Name	Description
parcel_addr	Address	Physical address of the parcel: building number and street name
prop_class	Property Class	Property class; NYS: 3-digit Property Class Code: http://www.tax.ny.gov/research/property/assess/manuals/prclas.htm NYC Only: PLUTO 2-digit Land Use Code: http://www1.nyc.gov/assets/planning/download/pdf/data-maps/open-data/pluto_datadictionary.pdf
total_av	Assessed Total Value	Assessed total value of the parcel
land_av	Assessed Land Value	Assessed land value of the parcel
full_market_val	Assessed Full Market Value	Assessed full market value of the parcel
yr_blt	Year Built	Year Built
sq_ft	Parcel Square Feet	Assessed area of the parcel in square feet

BILD
Data Design

Future Considerations

- This baseline data will be expanded in the next phase of the project with input from the Technical Working Group (TWG).
- Some attributes may only be available to specific users and some may be available to the public. Privacy and access levels can be set by this TWG according to dataset.
- Additional datasets for inclusion:
  - OGS State-owned Assets
  - HIFLD Critical Infrastructure
  - Red Cross Shelters
- Which datasets would be useful to your agency to integrate?
- Risk datasets such as floodplains will be handled in future scenario software tools.

BILD
Footprint to Parcel Spatial Conflation

In the first iteration, **OSM footprints** were included first – then, **Daylight** polygons were included wherever OSM footprints don't overlap. Future iterations will exhaust the total collection of footprints datasets.

- The image at right shows **OSM Footprints** in dark blue. The purple **parcels** do *not* contain NYS Buildings footprints, but the parcel data indicates that a building *should* be located on the parcel; **Daylight footprints** in orange, indicate where Daylight coverage exists but NYS Building Footprints does not. Evidence like this provided justification for utilizing Daylight data.

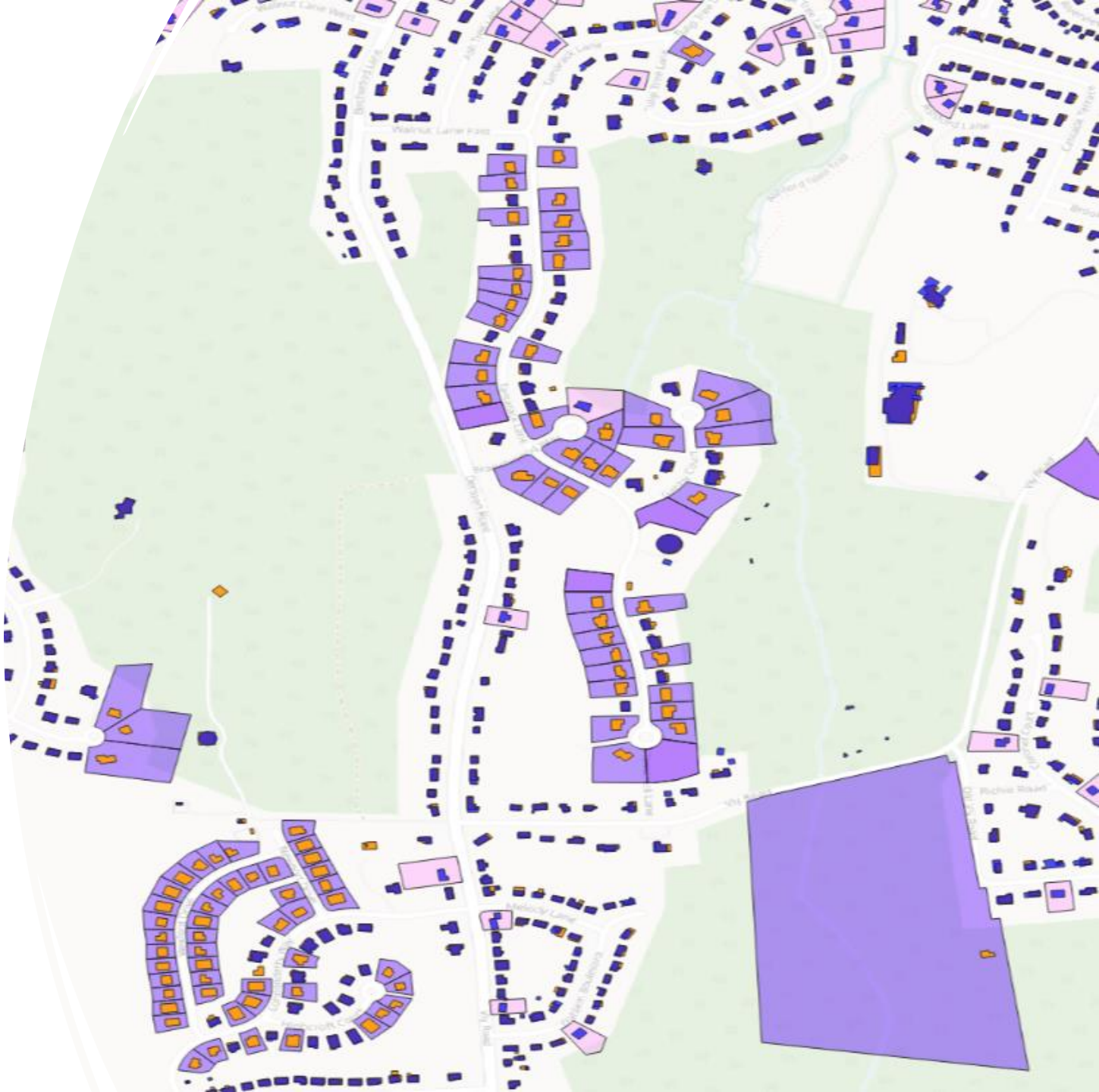


BILD Footprint to Parcel Conflation (cont'd)

- 91% of footprints are entirely contained by 1 parcel.
- 9% present the following problems/challenges
  - Many parcels sometimes map to many footprints at once:
    - Condominiums
    - High rises
    - Cartographic errors
  - New York City uses different property codes.
  - Counties control parcel information and data. Different county methodologies make some fields difficult to compare.
  - Examples of cartographic errors:
    - buildings that overlap with multiple parcels
    - multiple buildings overlapping with a single parcel

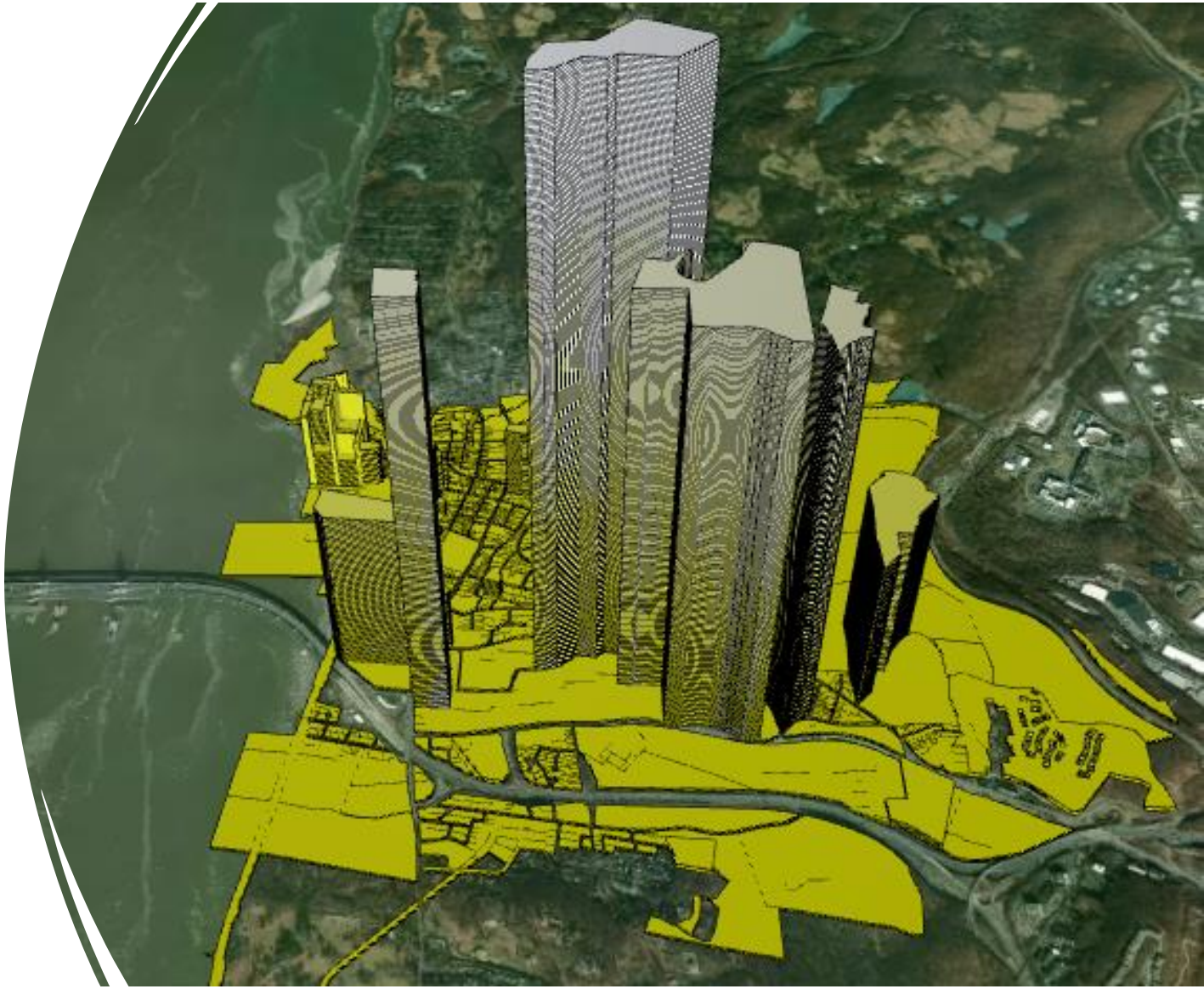


BILD
Footprint to Parcel Enrichment Conflation

This image shows how footprints (teal/purple) can overlap multiple parcel polygons (thin grey lines).

Some are legitimately on multiple parcels and some are errors.

Rule: Each building footprint is matched to all parcels that overlap at least 20% of the building's footprint area.

BILD
Building Footprints Enrichment - Assessed Value Methodology (cont'd)

- Most buildings have 100% of their area inside a single parcel, sharing that parcel with no other buildings (1:1). In such cases, assigning value is straightforward.
- Where building to parcel assignment is complicated, BILD proportionally calculates a Building Assessed Value based on the area of a building that intersects with a parcel.

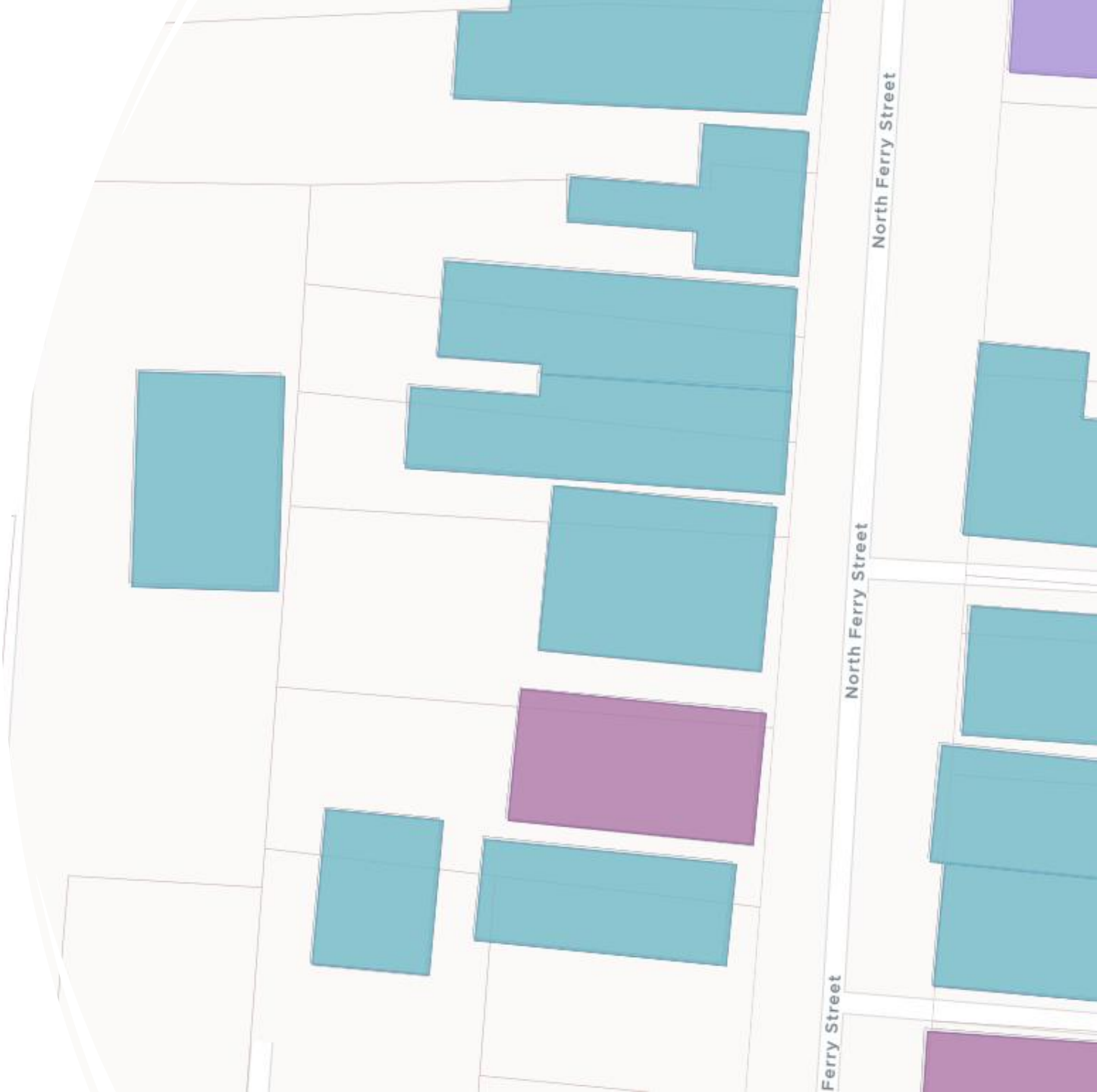


BILD Building Footprints Assessed Value Methodology

Parcels offer two value attributes: Total Assessed Value and Land Assessed Value. To ascertain the value of the structures on the parcel we take the difference.

Structures Assessed Values (SAV) are calculated from **tax parcel data** using the following calculation:

Total Assessed Value (TAV) minus **Land Assessed Value (LAV)**.

$$SAV = TAV - LAV$$

BILD Building Footprints Value Methodology

Proportional Building Value Rule

- **Building area (BA)** is the area of a building that is within a parcel.
- **Building area ratio (BAR)** is the proportion of one building's area to the total area of all building areas within the parcel. In parcels that intersect with multiple buildings, a **building area ratio** is found by dividing one **building area** by the **total** of all **building areas** within the parcel.

$$BA1 / (BA1 + BA2) = BAR1$$

$$BA2 / (BA1 + BA2) = BAR2$$

- The **Building Assessed Value (BAV)** is this **building area ratio (BAR)** multiplied by the **Structures Assessed Value (SAV)**.

$$BAR1 * SAV = BAV1$$

$$BAR2 * SAV = BAV2$$

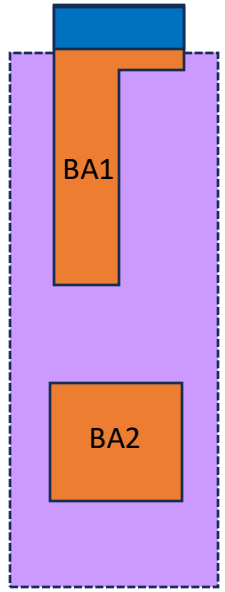


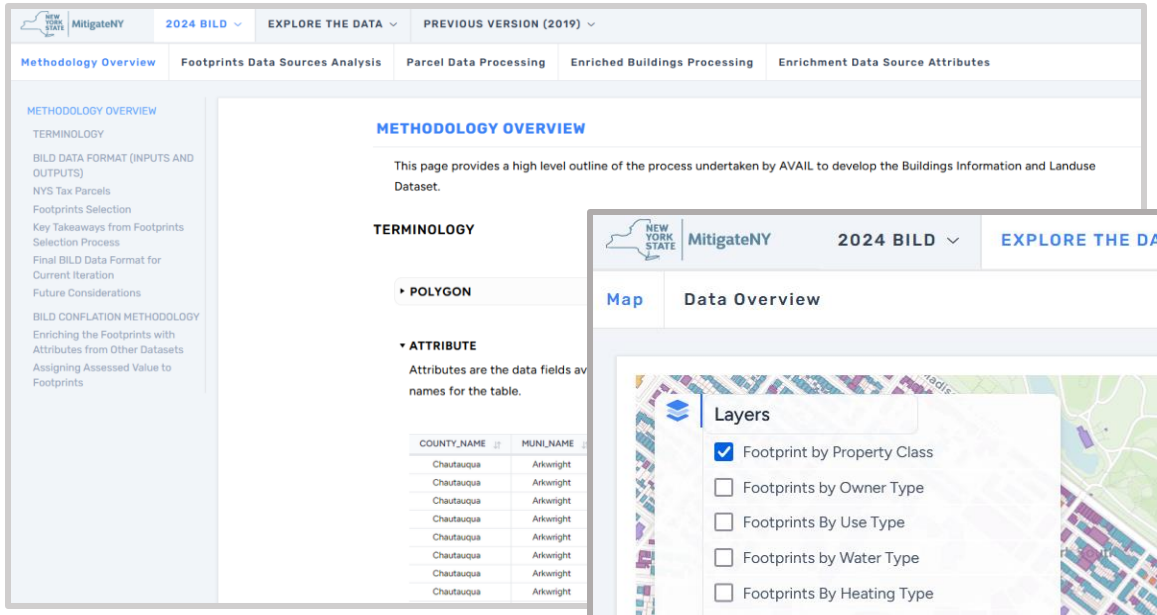
BILD Qualitative Attribute Assignment Methodology

Qualitative attributes can't be assigned proportionally (e.g., Property Type: residential v. industrial, Ownership Type: private v. municipal, etc.)

Rule: all qualitative attributes for complicated parcel-footprint relationships are assigned as two different attribute types:

- List: Assigns a list of all distinct types from all overlapping parcels and
- Dominant: Assigns a single type from the parcel that has the greatest footprint intersection area.

MNY Buildings – Current Status



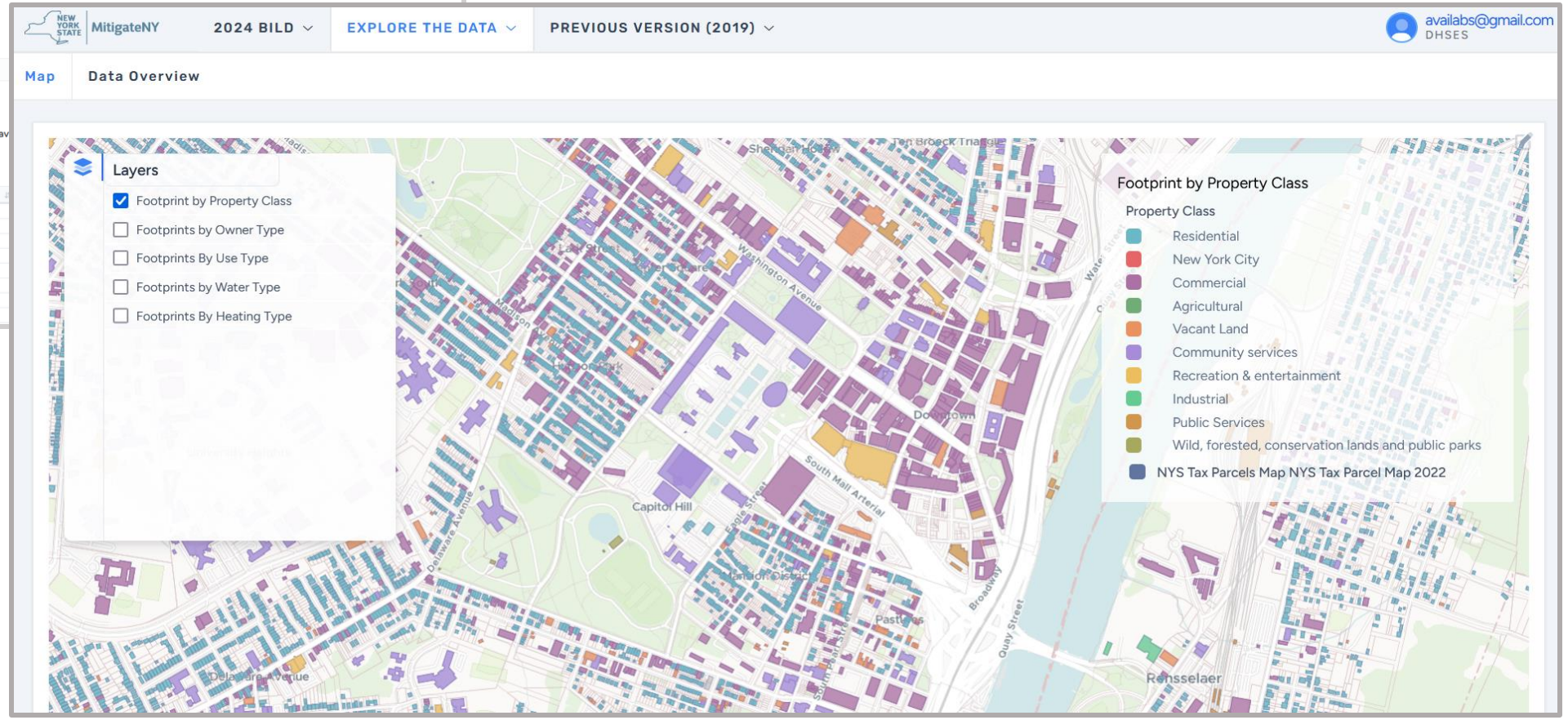


BILD Availability

Methods by which this information is available for review

- Downloads
  - Excel (csv), and Shapefile
- Tools
  - Map
  - Table Builder

How can this benefit other workflows?

Identify users, use cases and opportunities for integration

- Particularly "over-lapping" users
- On the ground community engagement

What else?

- Comprehensive Planning
- Development/Revitalization Efforts
- Code Enforcement
- Flood Disclosure
- Buyout Strategy

Use Cases: Local Hazard Mitigation Planning

Add, enhance, and ground truth building attributes, especially a "critical" designation by communities

Create 'zones': vulnerable areas, RL/SRL, flood zones resulting from drainage issues or "urban flooding"/excessive runoff

Zone outputs include #, location and values of all buildings inside the user-created polygon

Associate proposed actions and prepared grant applications with building footprints and parcels for spatial visualization and

Facilitation tool to encourage participation and detailed communication from planning participants

2023 New York State Hazard Mitigation Plan Update

FEMA approved and adopted by NYS Disaster Preparedness Commission in December 2023

CONTENT HIGHLIGHTS

- Risk Environments
- Hazard Profiles
- County Profiles
- Disaster Profiles
- State and Local Mitigation Strategies and Proposed Actions
- Climate Change

2023

Regulatory update of State Hazard Mitigation Plan

2024

Design firm overhaul of MitigateNY.org and User Interface

2024-2025

LHMP Platform Redevelopment

2025

MitigateNY Program & Platform Rollout to All Counties

2023-2028

SHMP Annual Maintenance, On-going Engagement and Content Enhancements leading to formal 2028 SHMP Update

BILD: Next Steps

Survey to Determine Participation Structure

Participation

- Engagement with Technical Working Group
- Subgroups (TBD based on participant interests/responses)
- Preferred communication
- Identification of external subject matter experts

Technical Review

- Are you (or is someone else in your agency) an expert in this type of data processing that wants to contribute to methodology and/or next steps?
  - Processing footprint data enrichment
  - Separating value of detached buildings (sheds)

Use-case and Dataset Discovery

- What will you use this for?
- Are there other datasets to be evaluated?

Proposed Timeline

- Next B-TWG meeting: end of June 2024
- Bi-monthly report outs: outcomes, participation, data

Contact Info & Data Access

ACCESS MNY

SHMP: mitigateny.org

BILD: buildings.mitigateny.org

Email: your email address
Password: BILD!

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