

GEOSPATIAL DATA IN HUMANITARIAN EMERGENCIES

Data for Good Hackathon
Know Before You Go

Led by: Snowflake & Direct Relief
Sponsored by: Mapbox, Sigma, & EY



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Beaune**

VP, Marketing
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VP, Data & Analytics
Direct Relief



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Applied Field
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Choudhary**

Senior Product
Marketing Manager
Snowflake



**Rob
Wright**

Senior Enterprise
Account Manager, BI
Mapbox



**Shawn
Namdar**

Strategic Alliance
Manager
Sigma

AGENDA

9:00 AM - 9:30 AM	<ul style="list-style-type: none">❖ Doors Open! Light food and beverage served❖ Find your table and meet your team
9:30 AM - 10:00 AM	<ul style="list-style-type: none">❖ Welcome and Introduction : Mike Johnson❖ Mapbox : Intro and Dataset Demo: Rob Wright❖ Sigma : Intro and Demo: Shawn Namdar
10:00 AM - 11:00 AM	<ul style="list-style-type: none">❖ About the Data for Good Program at Snowflake: Karen Beaune❖ Using Geospatial Data for Good: Fawad Qureshi❖ Direct Relief: Intro and Scenario setup: Andrew Schroeder❖ Deliverables and Judging Criteria: Farhan Choudary



AGENDA

11:00 AM - 12:30 PM	<ul style="list-style-type: none">• Working hours
12:30 PM - 1:15 PM	<ul style="list-style-type: none">• In-house lunch
1:15 PM - 1:30 PM	<ul style="list-style-type: none">• Re-engagement Exercise  or 
1:30 PM - 2:30 PM	<ul style="list-style-type: none">• Working Hours
2:30 PM - 4:00 PM	<ul style="list-style-type: none">• Team presentations, evaluations and a very unofficial awards ceremony



THANK YOU TO OUR PARTNERS



DirectRelief[®]



mapbox



sigma



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Prerequisites Before Summit

1. Review quickstarts and dataset documentation to come prepared
 - a. Understanding of [Discrete Global Grid H3](#)
 - b. Understanding of [Geospatial Data Types](#) and [Geospatial Functions](#) in Snowflake
 - c. Recommended: [Geospatial Analysis using Geometry Data Type](#) (80 min Quickstart)
 - d. Optional: [Performance Optimization for Geospatial queries](#) (95 min Quickstart)
 - e. Extra Credit: [Geospatial Analytics, AI and ML using Snowflake](#) (240 min Quickstart!?!)
2. Setup Sigma Trial Account - [Quickstart](#)
3. Sign Into your Snowflake Hackathon Account:
Accounts are being provisioned for you using DataOps.Live. We will send a link for you to claim your account in a separate email.
4. Explore the data in the Streamlit App and Notebook
5. Install Overture Maps from Carto in [Snowflake Marketplace](#)



Streamlit: Data Explorer

Snowflake session active!

Data Source Selection

Choose the database, schema, and table you want to explore.

Select Database: DATAOPS_EVENT_PROD

Select Schema: HACKATHON_DATASETS

Select Table: MAPBOX_ACTIVITY

Made with ❤️ using [Streamlit](#) in [Snowflake](#).

This app is a starting point. Explore Streamlit's documentation to discover more features!

XLAT

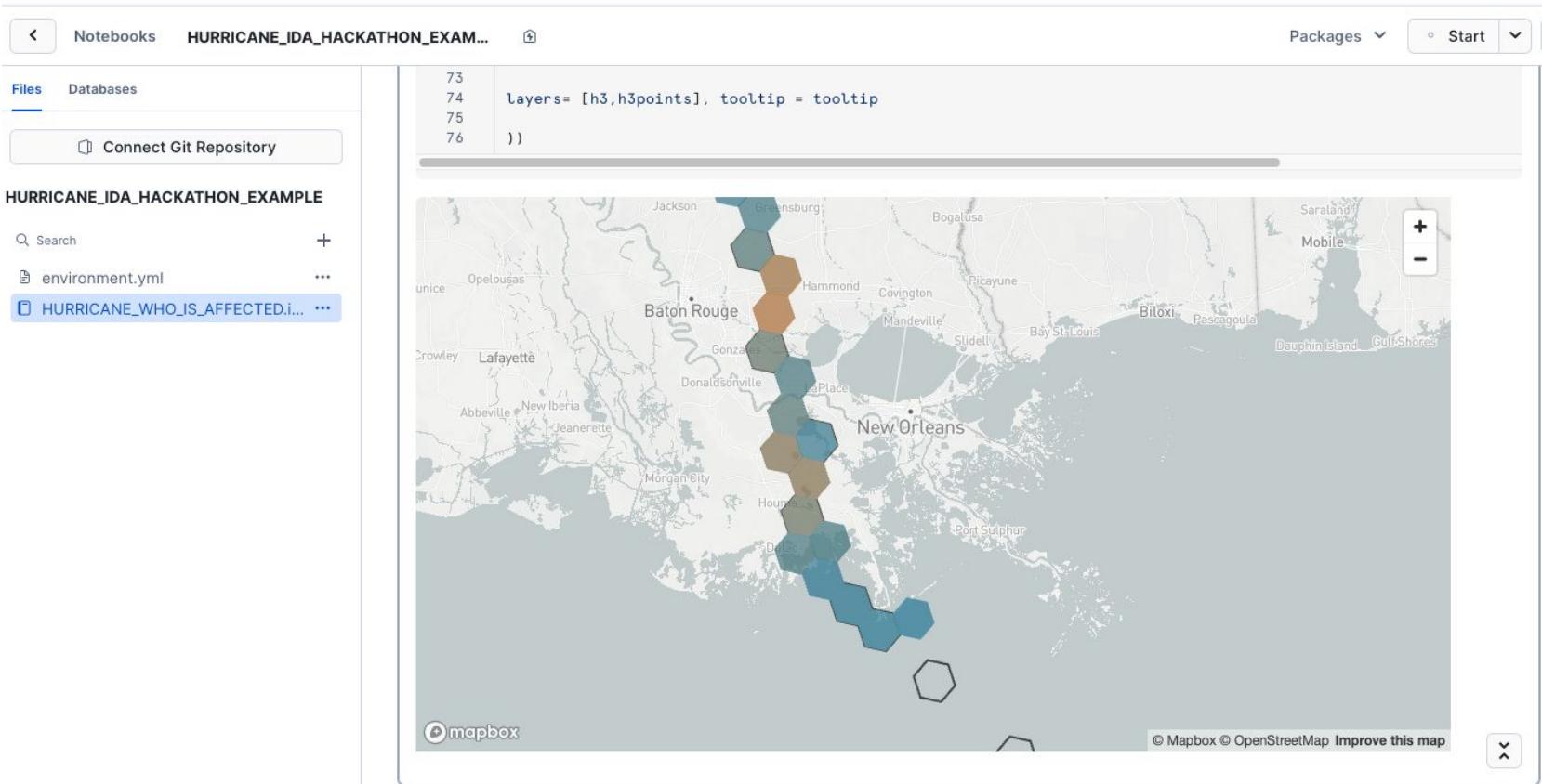
Select Longitude Column: XLONG

Plot Map

Fetching data from DATAOPS_EVENT_PROD.HACKATHON_DATASETS.MAPBOX_ACTIVITY (limit 10000)...

A map of the southern United States, specifically the states of Louisiana, Mississippi, Alabama, Georgia, and parts of Texas and Florida. The map displays several cities labeled: Shreveport, Monroe, Jackson, Hattiesburg, Tuscaloosa, Montgomery, Columbus, Macon, Dothan, and Pensacola. A large cluster of red dots representing activity data is visible in the southeast, centered around the Atlanta and Birmingham areas. The map also shows state boundaries and major rivers. A Mapbox logo is in the bottom left corner, and a copyright notice at the bottom right.

Notebook: Geospatial visualizations



Map

UPPER MEZZANINE MONDAY



■ ADVANCED TRAINING: FRESH SNOW

Room 154

■ BEGINNER TRAINING: SNOWFLAKE FOUNDATIONS

Room 158

■ BREAKOUT SESSIONS

Room 151, 155, 157, 160

■ DATA FOR GOOD HACKATHON

Room 153



Hackathon Logistics

Event Date

Monday, June 2nd 9:00 AM - 4:00 PM

Event Location

San Francisco, CA

Room 153 (Moscone South, Upper Mezzanine)

Overview

Snowflake's End Data Disparity initiative accelerates progress toward the UN Sustainable Development Goals by ensuring data sets, decision-making tools and AI models represent everyone. Participants will explore geospatial analytics for humanitarian efforts, perform data transformation in Snowflake and create interactive visuals with Streamlit. The Data for Good team will share insights and tools in future workshops, fostering collaborations that benefit communities and the planet.

Teams / Attendees

Teams will consist of five members, you will be assigned on the day of the event. Please check in at the front of the room. If you know a colleague who is also attending you can request to be on the same team.

High-Level Agenda

- Introduction, team formation, and problem statement briefing.
- Data exploration, brainstorming, and initial development.
- Prototype development and testing.
- Final presentations and judging.

Expected Output / Judging

The primary goal is to have fun and collaborate for the greater good. Throughout the day, teams will be judged on their progress. A shortlist of teams will be selected based on three categories, who will then present their work during the final hour. Final judging will determine the winning solutions.



Hackathon Objective

Problem Statement

The Direct Relief analytics team, whom you are supporting, is looking at three phases of data analysis which may be able to support their operational decision making over the course of a hurricane event (Hurricane Ida in 2021 in USA)

Objective

Leverage data from Direct Relief, Mapbox, Overture Maps, and other public datasets to showcase Snowflake features, along with tools like Sigma, to understand hurricane impacts on the healthcare system and the populations served.

- Use Snowpark, Streamlit, geospatial analytics, and the Snowflake Marketplace
- Create analysis and data visualization applications with Streamlit and Sigma
- Gain location insights using geospatial analytics and Carto
- Apply machine learning with Snowpark & Snowflake Cortex

Awards

- Best use of Snowflake
- Most Advanced Build
- Most Insightful Solution



Hackathon Objective

Scenario

The disaster relief non-profit, **Direct Relief**, is watching the unfolding situation closely in anticipation of the need to respond quickly, accurately, and appropriately to humanitarian medical needs as they occur. The primary role of Direct Relief is to support healthcare systems in times of crisis through shipments of essential medicines and medical supplies, and to act as a grantor during the post-event recovery, in order to make sure that healthcare systems that serve the most vulnerable are able to meet the needs of their patients regardless of who they are or whether they have the ability to pay.

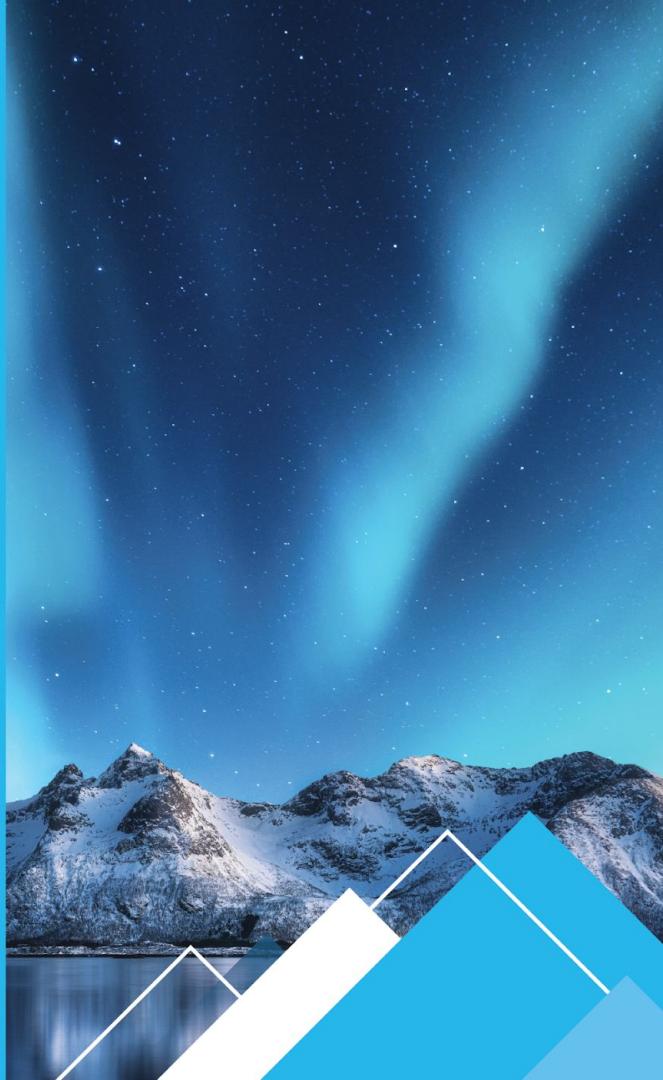


Hackathon Objective

Scenario

The Direct Relief analytics team, whom you are supporting, is looking at three phases of data analysis which may be able to support their operational decision making over the course of this event.

1. In the first phase, focused on **risk and vulnerability analysis** prior to the landfall of the storm, it is important to anticipate where the hurricane will have the greatest impact on people, buildings, health infrastructure, transportation networks, and other vital systems, and to describe the connections between those impacts.
2. During the second phase, **focused on situational analysis**, it is important to understand events unfolding in real time which indicate how the storm is actually having rapidly changing impacts on the aspects of social life and the built environment which were the focus of the risk analysis.
3. In the third phase, **focused on post-event evaluation and prioritization** for disaster recovery, it is important to report on the nature of the impacts which occurred so that aid shipments and other resources can be allocated to support the needs of the population.



Hurricanes and Floods
present a challenge are
becoming increasingly
more frequent and
more devastating

An aerial photograph capturing a severe flooding event in a residential neighborhood. Streets and yards are completely inundated with brown, muddy floodwater. Several houses of various architectural styles are visible, some with their lower levels submerged. A small boat is seen moving through the water on one of the flooded streets, creating a white wake. Power lines are partially submerged or hanging low over the floodwaters. The surrounding landscape is a mix of flooded lawns and trees, illustrating the extensive nature of the flooding.

USA Today/Hurricane Harvey



**Satellite imagery is critical in telco,
energy, insurance, logistics,
government and more industries.**

**Using it can save significant costs,
improve decision-making and
mitigate risks.**

DATA FOR GOOD COMMITMENT

Dedicated to aligning with global movements, we leverage our platform and AI Data Cloud ecosystem for positive social change focusing on : Diversity, Public Health, Climate Resilience, Social Justice and Education.

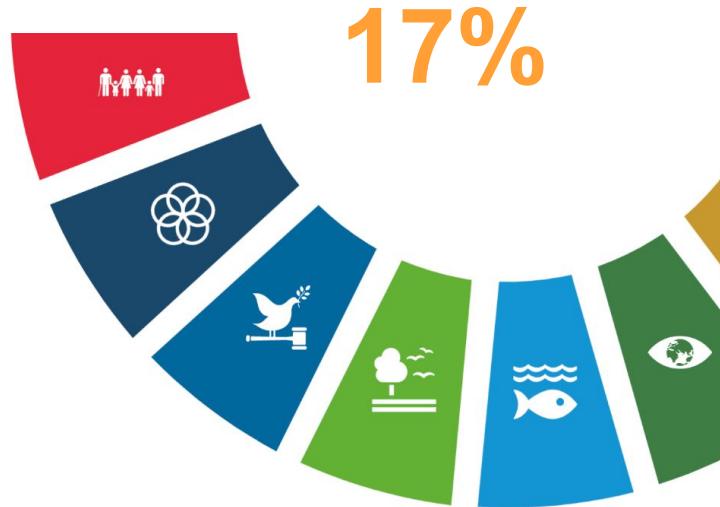


END DATA DISPARITY

**IN 2015, WORLD LEADERS AGREED TO
17 GLOBAL GOALS.**

We're beyond the halfway mark to achieving the Sustainable Development Goals (SDGs) by 2030, and only 15% of them are on track. COVID-19, the cost of living, conflict, the climate crisis – such as floods, heatwaves, wildfires – have set us back, but hope remains. Find out how you get involved and explore more about each of the Global Goals below.

START NOW



Why Data Disparity?

Data disparity includes

- Data Collection
- Data Quality
- Data Access
- Data Analytics

Through SDG 17, Snowflake can bridge the gap to help develop measurable progress

- Improved access to tool and ideas
- Connection between technology and field expertise
- Address data quality and diverse data



END DATA DISPARITY COMMITMENT

Mission Statement

Our mission is to understand, identify and address DATA DISPARITY hindering global progress. Our commitment is to enable, guide and gather expertise to accelerate progress towards the UN SDGs, facilitating Data Sharing and Collaboration.

WHAT DOES
DATA DISPARITY
MEAN?

Lack of data

Gap in representation

Inequalities in accessing the data

ENDING DD WILL HELP
ACCELERATE GLOBAL
EFFORTS



END DATA DISPARITY

EXPERT PANEL



Benoit Dageville
Co-Founder & President of
Products Snowflake

[LinkedIn](#)



Denise Persson
Chief Marketing Officer
Snowflake

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Arndt Brinkmann
Senior Director, Associate
General Counsel, Snowflake

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Karen Beauné
VP EMEA Marketing
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Lisa Lim Ah Ken
Senior Specialist, Climate Action
IOM, UN

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Elena Philipova
Director, Sustainable Finance &
Investment, Data & Analytics, LSEG

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Jennifer L. Wong
Former Global Head, Strategy and Business
Transf, Digital Data and AI, Sanofi

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Mats Pellbäck Scharp
Chairman, We Don't Have Time

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Stephen C. Daffron
Chairman at BetaNXT and Founding
Partner at Motive Partners

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Dr Tom Chatfield
Author and Tech Philosopher

[LinkedIn](#)



Elisabetta Pietrostefani
Lecturer in Geographic Data Science,
University of Liverpool

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Brian Dummann
CDO, Technology Innovation &
Architecture, AstraZeneca

[LinkedIn](#)

HOW CAN YOU BE INVOLVED

- Read our whitepaper at
snowflake.com/end-data-disparity
- Meet our Expert Panelists
- Join the movement



LinkedIn



[End Data Disparity](#) - Watch the Intro Video



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EVALUATION CRITERIA



Judging Criteria



Functionality & Completeness



Code Quality & Readability



Error Handling & Validation



Snowflake Platform Utilization



AI & Streamlit Capabilities



Teamwork & Collaboration

MEET YOUR JUDGES



**Jennifer L.
Wong**

Executive Dir,
CEO Roundtable
on Cancer



**Lisa
Lim Ah Ken**

Senior Specialist,
Climate Action
IOM, UN



**Elena
Philipova**

Director,
Sustainable
Finance &
Investment, Data
& Analytics, LSEG



**Brian
Dummann**

CDO, Technology
Innovation &
Architecture,
AstraZeneca

Awards



**BEST USE OF
SNOWFLAKE**



**MOST
ADVANCED
BUILD**



**MOST
INSIGHTFUL
SOLUTION**

Data Sets

- ❖ Hurricane Ida Tracking Data
- ❖ Overture Maps
- ❖ Homeland Infrastructure Foundation-Level Data (HIFLD)
- ❖ Census data: American Community Survey
- ❖ 2020 US Census: Population Block Group
- ❖ County Health Rankings:
- ❖ FEMA National Risk Index (NRI)
- ❖ CDC Social Vulnerability Index
- ❖ Primary Healthcare Sites (Federally Qualified Health Centers):
- ❖ Mapbox activity index for time period of Hurricane Ida (2021):
- ❖ NOAA historical hurricane data
- ❖ Power Outage Data



Available Tools



Hackathon Account

Explore any Snowflake features (Cortex, Streamlit, Notebooks)



Free Trial Account

to explore GIS Features to profile and join datasets easily for exploratory analysis

JOINT DEVELOPMENT FOUNDATION PROJECT



Overture Maps

Free dataset provided by Carto on Snowflake Marketplace containing: Buildings, Roads, Transport, and more



Sigma: Enterprise BI. Spreadsheet UI.

Snowflake + Sigma = Better together

Next Generation Business Intelligence

Sigma scales billions and trillions of records using sheets, SQL, Python, or AI—without compromising speed or security.

Analyze with spreadsheets, build dashboards, scale your work with data applications, and embed it anywhere.

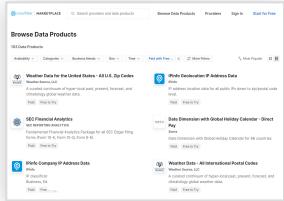
The screenshot shows the Sigma interface with a "Revenue Analysis" project open. On the left, there's a sidebar with tabs for "ADD NEW" (Elements, Layouts), "DATA ELEMENTS" (Table, Viz, Pivot Table), "INPUT TABLES" (Empty, Linked), and "UI ELEMENTS". The main area displays two tables: "Input Table - Brands to Keep" and "Retail Sales by Brand". Below the tables are two charts: "Profit by Status and Industry" (a stacked bar chart) and "Revenue Forecasting" (a pie chart).



Together we empower your teams with scalable, cloud-native data analytics and visualization capabilities.

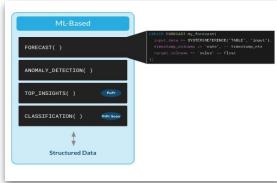


Snowflake Key Features



Snowflake Marketplace

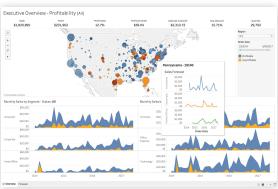
Quick access to Cybersyn datasets and other publicly available datasets to support analysis



Snowflake ML Functions

Use pre-trained ML models through SQL Functions for quicker insights around forecasting, classification, and anomaly detection

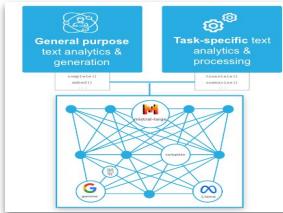
Quick Start Guide: [Cortex ML Functions](#)
[Cortex ML Classification](#)



Geospatial Features

Leverage all the great geospatial features in Snowflake like Geography Types, OGC-Compliant Functions and more

Quick Start Guide: [Geospatial](#)



Cortex LLM Functions

Leverage power of specialized and general LLMs through SQL Functions to draw insights from unstructured data

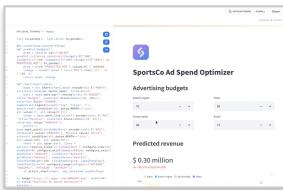
Quick Start Guide: [Cortex Specialized LLM](#)
[Geospatial & Cortex](#)



Snowpark

Leverage Snowpark for DE & ML tasks to use familiar languages (Python, Java, Scala) and libraries to enhance analysis of data in Snowflake

Quick Start Guide: [Snowpark API](#)
[Snowpark ML API](#)



Streamlit in Snowflake

Build a web application within your Snowflake environment to take your insights and make them easily consumable with widgets, like drop-downs, charts and chat interface

Quick Start Guide: [Build a Streamlined App](#)



See you soon!



SIMPLE COORDINATED vs. GEO DATA TYPES

Storing geo data as a native geo data type provides benefits

- Simplifies code:
`st_within(t1.shape, t2.shape)`
vs
`st_within(st_makepoint(t1.longitude, t1.latitude), t2.shape)`
- Enables support for more dimension types (multipoint, linestring, polygon, collection)
- Improves performance, especially for joins
- Ability to validate geo objects
- Enables Search Optimization

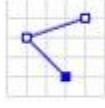
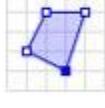
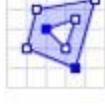


```
1 CREATE OR REPLACE TABLE ALL_NODES_STG (
2   WAY_ID NUMBER(38,0),
3   LONGITUDE FLOAT,
4   LATITUDE FLOAT,
5   TAGS VARCHAR(16777216)
6 );
7 CREATE OR REPLACE TABLE ALL_NODES (
8   WAY_ID NUMBER(38,0),
9   SHAPE GEOGRAPHY,
10  TAGS VARCHAR(16777216)
11 );
```



Well Known Text

Well-known text (WKT) is a text markup language for representing vector geometry objects. A binary equivalent, known as well-known binary (WKB), is used to transfer and store the same information in a more compact form convenient for computer processing but that is not human-readable.

Type	Examples
<u>Point</u>	 POINT (30 10)
<u>LineString</u>	 LINESTRING (30 10, 10 30, 40 40)
<u>Polygon</u>	 POLYGON ((30 10, 40 40, 20 40, 10 20, 30 10))
<u>Polygon</u>	 POLYGON ((35 10, 45 45, 15 40, 10 20, 35 10), (20 30, 35 35, 30 20, 20 30))



H3 FUNCTIONS

H3_LATLNG_TO_CELL	H3_GRID_DISK
H3_POINT_TO_CELL	H3_GRID_PATH
H3_CELL_TO_BOUNDARY	H3_INT_TO_STRING
H3_CELL_TO_CHILDREN	H3_POLYGON_TO_CELLS
H3_CELL_TO_PARENT	H3_STRING_TO_INT
H3_CELL_TO_POINT	H3_IS_PENTAGON
H3_COVERAGE	H3_IS_VALID_CELL
H3_GET_RESOLUTION	H3_COMPACT_CELLS
H3_GRID_DISTANCE	H3_UNCOMPACT_CELLS



H3_COVERAGE



H3_POLYGON_TO_CELLS



THE IMPORTANCE OF LOCATION DATA

There will be 30 Billion connected devices by 2030

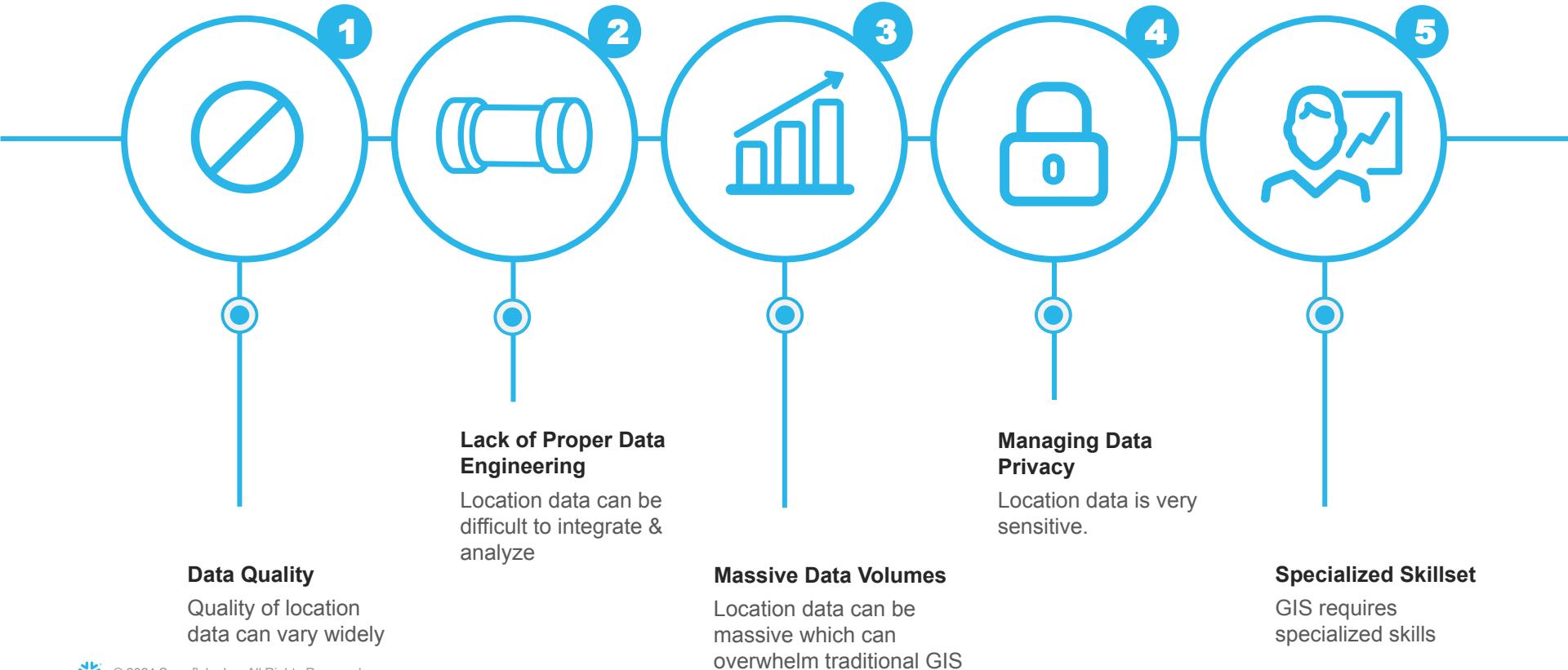


Everything happens somewhere



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CHALLENGES IN HANDLING LOCATION DATA AT SCALE



Breaking the GIS Data Silo

Why have they remained separate?

Traditional DWH



Designed to manage and analyze large volumes of structured data



Built for SQL based processing only



Lack of workloads isolation



Lacks specialized GIS processing capabilities



GIS Technologies



Designed to manage and analyze spatial data



Ability to run complex GIS processing



Unable to process large amounts of structured data



Inability to run multiple workloads



USE CASES ACROSS ALL INDUSTRIES



Telecommunications

Network Optimization
Data Monetization
Churn Reduction



Retail & CPG

Site Planning
Indoor Mapping
Supply Chain Design



Transport & Logistics

Mobility Planning
Territory Management
Fleet Routing & Tracking



Cities & Government

Smart Cities
Open Data
Citizen Services
Public Safety



Sustainability

Regulatory Compliance
Circular Design
Resource Management
Climate Change Mitigation



Financial Services

Risk Assessment
Investment Analysis
Fraud Detection
Geomarketing



Healthcare & Pharma

Territory Management
Site Planning
Healthcare Factor Analysis



Utilities

EV Infrastructure Rollout
Territory Management
Churn Reduction



Risk analysis

Company Goal: Mitigate risks in insured portfolio.

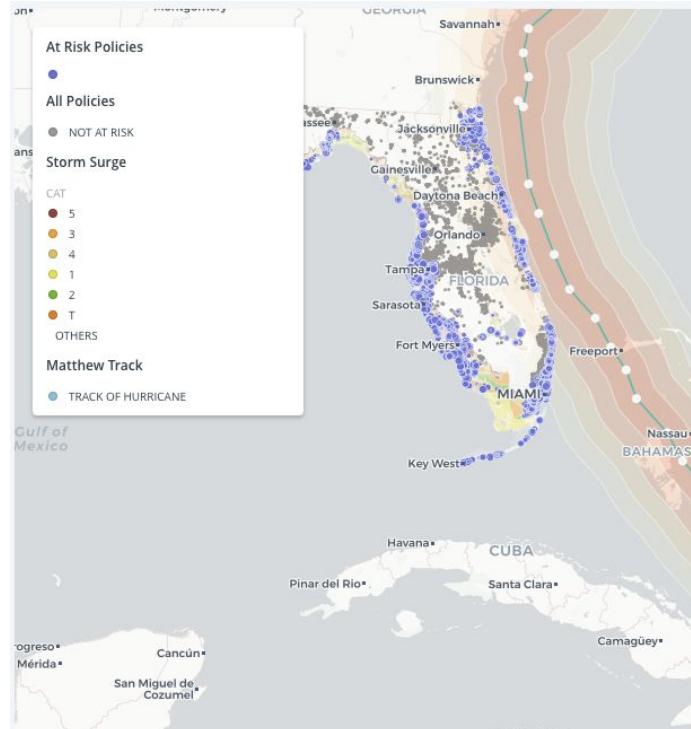
Approach: Do catastrophe modeling and exposure management

Datasets

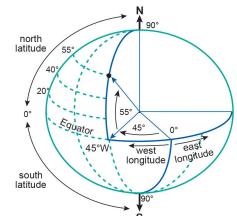
- Flood data
- Meteorological and disaster data
- Topographic and Hydrologic Data

Features

- Geospatial Function
- Discrete Global Grid H3
- Streamlit in Snowflake or partner visualization tools



Snowflake for Geospatial Data



Native Functions

Two data types with more than 60 functions for each type.



Fast search & Geo-Joins

10X speedup on Geo queries.
Fast geospatial joins



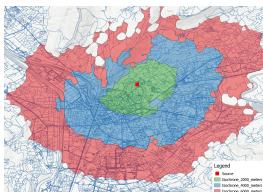
Spatial grid

Tessellation and grid-based operations



H3 Support

Native functions providing extremely fast processing



Spatial Datasets

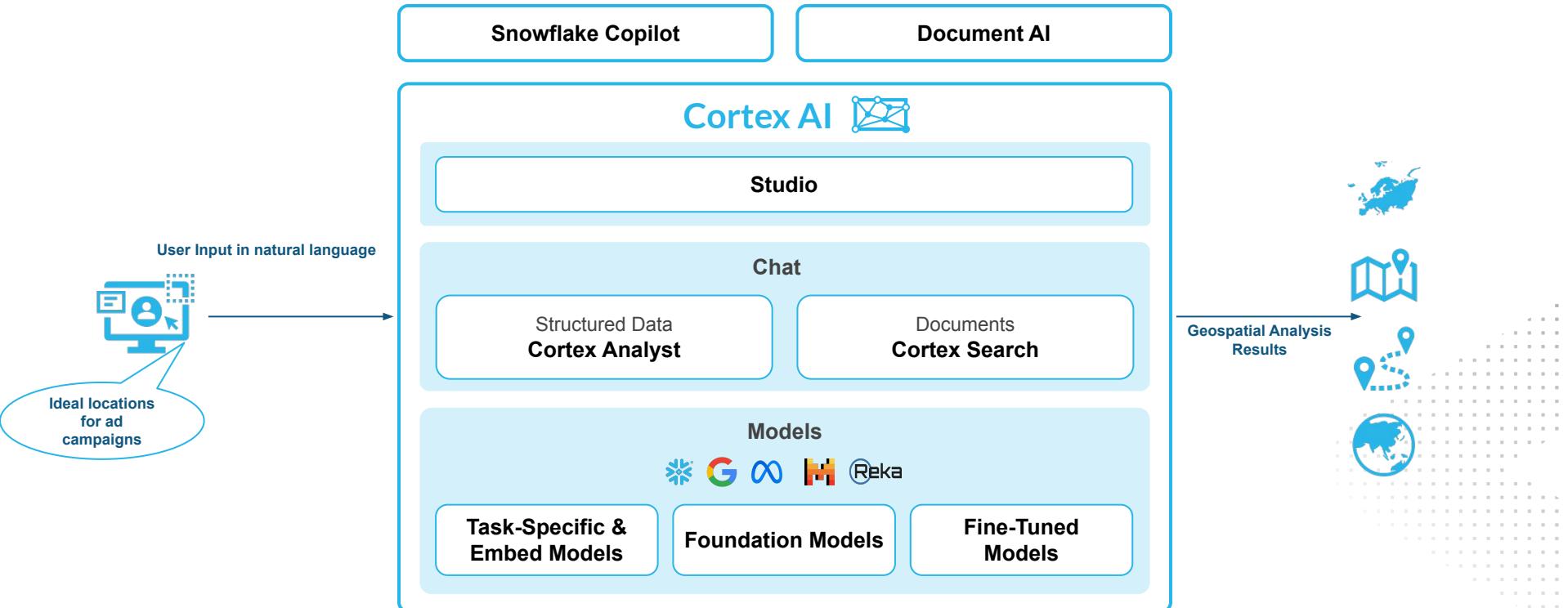
250+ geo datasets in Snowflake Marketplace



Advanced Native Applications

Advanced geo features via hosted services and apps

Generative AI & Spatial Insights

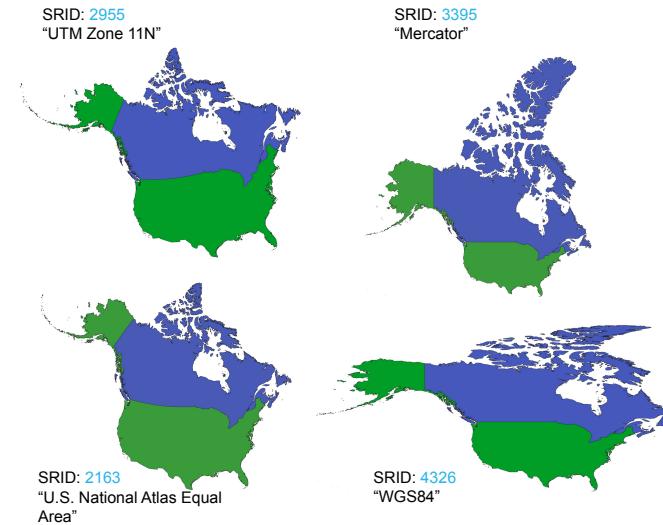


TWO NATIVE GEO DATA TYPES



GEOGRAPHY

Models Earth as an Ellipsoid
Supports WGS84 (4326) SRS



GEOMETRY

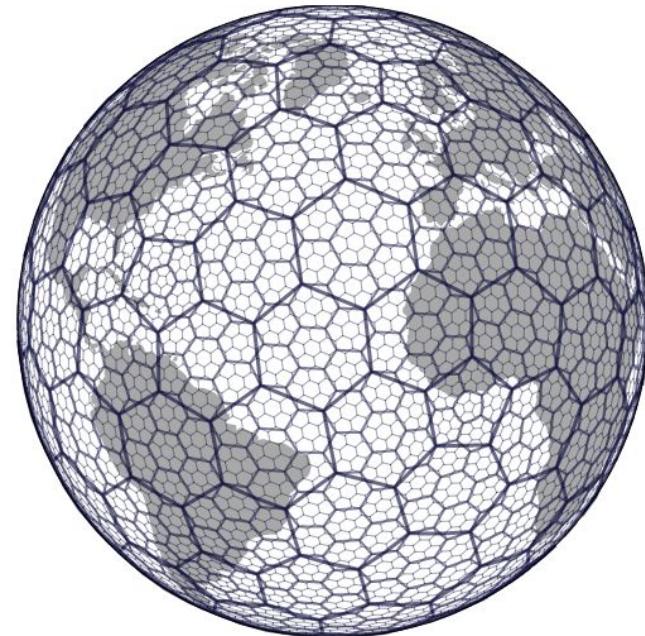
Models Earth as a Cartesian plane
Supports many Spatial Reference Systems
Can be faster for local spatial calculations



DISCRETE GLOBAL GRID H3

A hierarchical grid that divides the world into hexagonal cells of equal sizes

- Maps any coordinate point onto a hexagon
- Hierarchical system
- Divides the world perfectly into hexagons
- Each cell has a unique ID (String or Integer)
- Cells have 16 different sizes (resolutions)



H3 Zoom Level

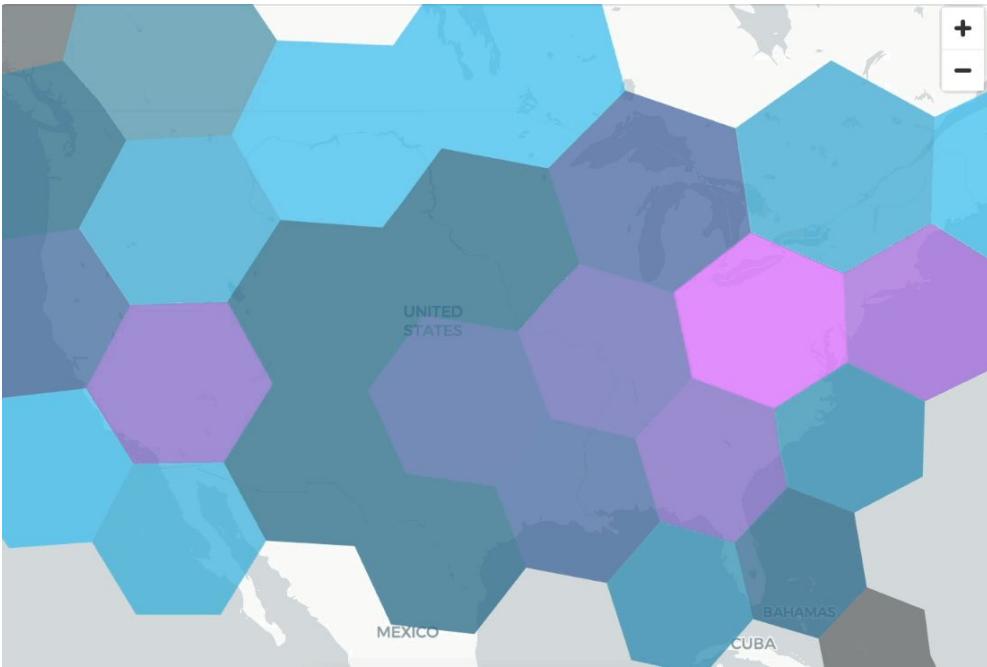
H3 Resolution	Average Hexagon Area (km ²)	Average Hexagon Edge Length (km)	Number of unique indexes
0	4,250,546.8477000	1,107.712591000	122
1	607,220.9782429	418.676005500	842
2	86,745.8540347	158.244655800	5,882
3	12,392.2648621	59.810857940	41,162
4	1,770.3235517	22.606379400	288,122
5	252.9033645	8.544408276	2,016,842
6	36.1290521	3.229482772	14,117,882
7	5.1612932	1.220629759	98,825,162
8	0.7373276	0.461354684	691,776,122
9	0.1053325	0.174375668	4,842,432,842
10	0.0150475	0.065907807	33,897,029,882
11	0.0021496	0.024910561	237,279,209,162
12	0.0003071	0.009415526	1,660,954,464,122
13	0.0000439	0.003559893	11,626,681,248,842
14	0.0000063	0.001348575	81,386,768,741,882
15	0.0000009	0.000509713	569,707,381,193,162



H3 USE CASES

For Analytics, Machine Learning and Performance Optimization

- Visualization
- Aggregating market signals per hexagon
- Replace geo lookups/joins with H3-based



H3 as a Common Key for Data Collaboration

Easily combine multiple spatial data sources together



ANALYZING SPATIAL DATA

Any vector object

- Valid/invalid shapes

Measurement functions

- ST_DISTANCE
- ST_AREA

Relationships

- ST_INTERSECTS
- ST_CONTAINS

Transformations/Aggregations

- ST_COLLECT
- ST_UNION

Support for various SRIDs

- ST_SRID
- ST_SETSRID
- ST_TRANSFORM

Discrete Global Grid: H3

- H3_LATLNG_TO_CELL
- H3_POLYGON_TO_CELLS
- H3_COVERAGE

Discrete Global Grid: Geohash

- ST_GEOHASH
- ST_GEOGFROMGEOHASH
- ST_GEOPOINTFROMGEOHASH

User Defined Functions

- Python
- JavaScript
- Java

External Functions

- E.g. for Routing

Partner Functions

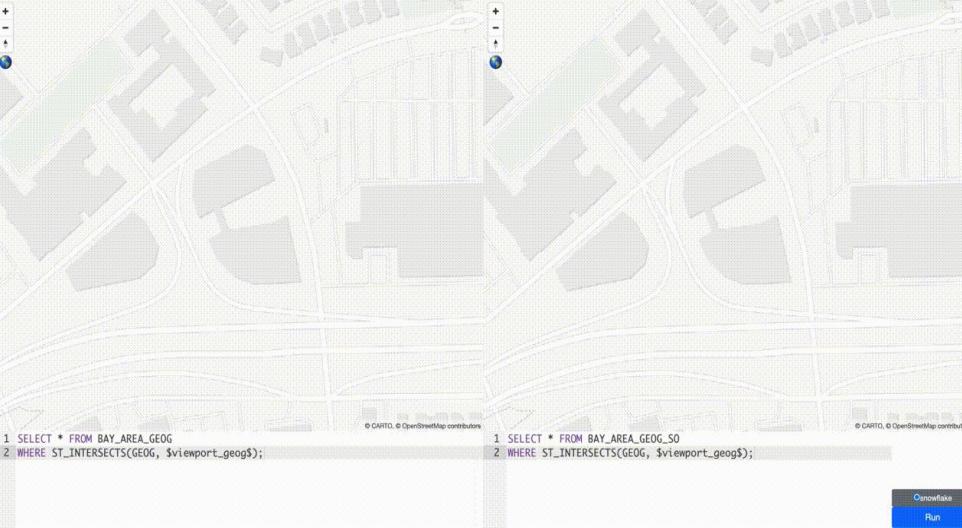
- CARTO Spatial Extension
- Mapbox GEO



FASTER SEARCH

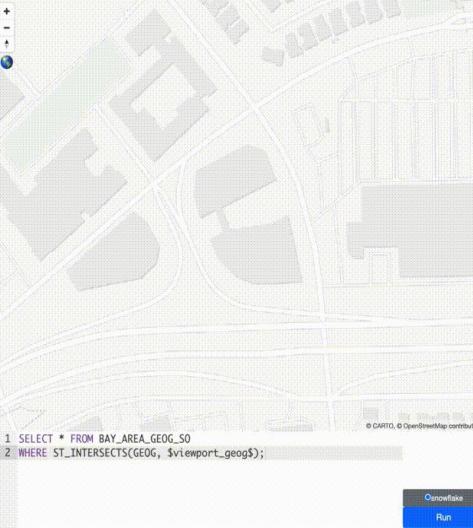
Quickly find objects by their coordinates while using a bounding box or point lookup search

Before



```
1 SELECT * FROM BAY_AREA_GEOG  
2 WHERE ST_INTERSECTS(GEOG, $viewport_geog$);
```

With Search Optimization



```
1 SELECT * FROM BAY_AREA_GEOG_S0  
2 WHERE ST_INTERSECTS(GEOG, $viewport_geog$);
```

Snowflake Run

Find all lakes and rivers that intersect the current map view

```
SELECT name, geo FROM AREA_WATER  
WHERE ST_INTERSECTS($search_box, geo);
```

Use with predicates

ST_INTERSECTS
ST_CONTAINS, ST_WITHIN
ST_COVERS, ST_COVEREDBY

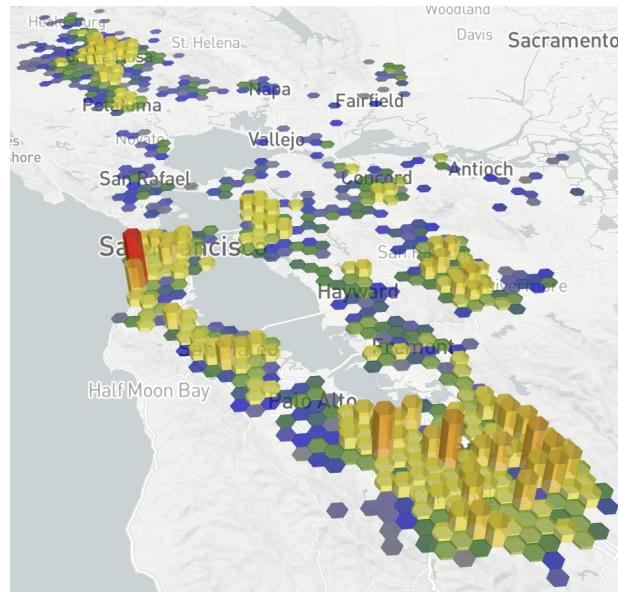
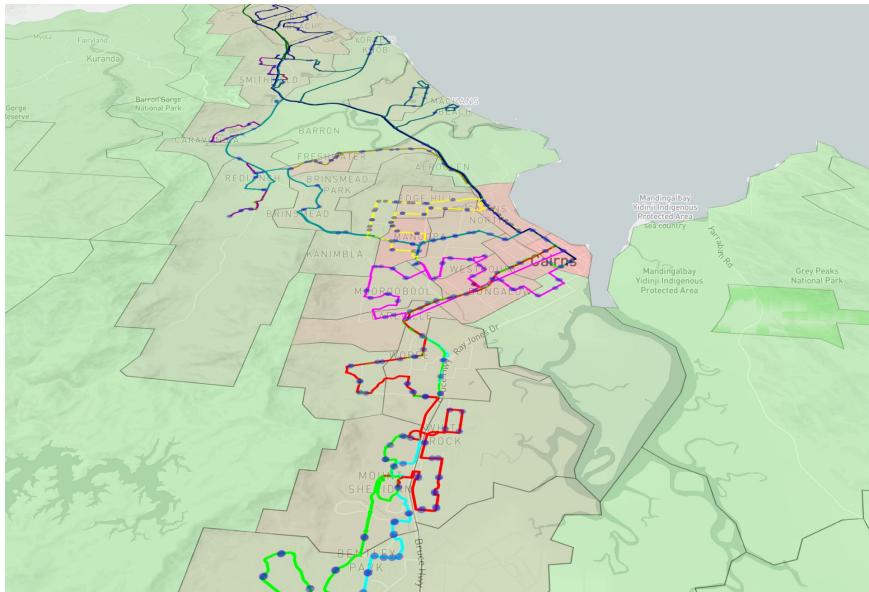
Most effective when data is clustered by proximity:

ST_GEOHASH
X,Y coordinates of the centroid
Coordinates of the bounding box



GEO VISUALISATION IN STREAMLIT

Build GEO dashboards in Snowflake



Use, Folium, Plotly, Pydeck etc. to visualize vector and H3 datasets



GEOSPATIAL MARKETPLACE

Rapidly growing list of location datasets,
extended functions and data apps

Data Providers

CARTO, Mapbox, Precisely, Sonra, Safegraph,
Foursquare, Lifesight, PlaceIQ, ...

Types of data

Demographics, Places of interest, Addresses...

Functions

Extended spatial functions (e.g. for clustering)

Disclaimer: Marketplace listings displayed herein are provided for illustrative purposes only. Access to and use of Marketplace listing data remains subject to the applicable listing provider terms and conditions, which control in all respects.

The screenshot shows the Snowflake Marketplace interface. At the top right is a search bar labeled "Search Snowflake Marketplace" and a "Browse Data Products" button. Below the search bar are three cards for "SafeGraph", "Weather Source, LLC", and "CARTO". Each card includes a logo, the provider name, a brief description, and a "Free" or "By Request" badge. The "SafeGraph" card also has a "Free" badge below it. The "Weather Source, LLC" card has a "Free" badge below it. The "CARTO" card has a green checkmark icon to its right. In the bottom row, there are two more cards for "Sonra" and "Tableau Software". The "Sonra" card for "OpenStreetMap New York" has a "Free" badge below it. The "Tableau Software" card for "Tableau American Community Survey Dataset" has a "Free" badge below it.

Provider	Description	Availability
SafeGraph	US Open Census Data & Neighborhood Insights - Free Dataset	Free
Weather Source, LLC	Global Weather & Climate Data for BI	Free
CARTO	Analytics Toolbox	Free
Sonra	OpenStreetMap New York	Free
Sonra	USA: ZIP+4 Codes & Address Data	By Request
Tableau Software	Tableau American Community Survey Dataset	Free





Overture Maps

Open Source POI Data: Available for free through Snowflake Marketplace



Contributor Members



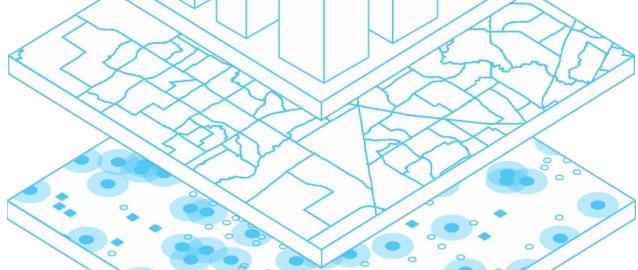
Buildings

600M buildings



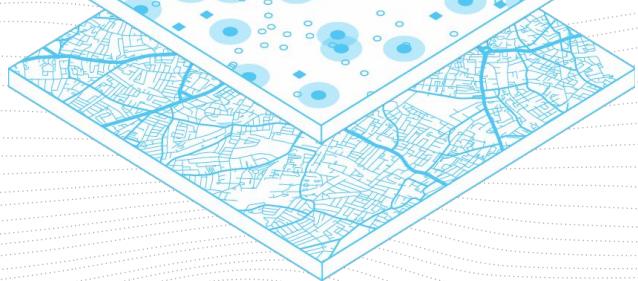
Boundaries

500M polygons



POIs

10M POIs



Roads

Pretty much everything

MAPBOX GEOCODING & ANALYSIS

Mapbox offers tools and services that enable developers to create interactive maps and run spatial analysis.

Offer a native application with advanced geo features:

- Geocoding
- Boundaries
- Isochrones
- Distance and duration

