**SQL**

use [Climate change 2025]

-- Create a combined table

SELECT \* INTO Climate\_Change\_Combined\_Data

FROM canada\_climate\_data

UNION ALL

SELECT \* FROM brazil\_climate\_data

UNION ALL

SELECT \* FROM australia\_climate\_data

UNION ALL

SELECT \* FROM india\_climate\_data

UNION ALL

SELECT \* FROM usa\_climate\_data

UNION ALL

SELECT \* FROM germany\_climate\_data

UNION ALL

SELECT \* FROM south\_africa\_climate\_data;

-- Create a combined table

SELECT \* INTO Climate\_Change\_Combined\_Data

FROM canada\_climate\_data

UNION ALL

SELECT \* FROM brazil\_climate\_data

UNION ALL

SELECT \* FROM australia\_climate\_data

UNION ALL

SELECT \* FROM india\_climate\_data

UNION ALL

SELECT \* FROM usa\_climate\_data

UNION ALL

SELECT \* FROM germany\_climate\_data

UNION ALL

SELECT \* FROM south\_africa\_climate\_data;

-- Check for duplicates

SELECT Record\_ID

FROM Climate\_Change\_Combined\_Data

group by Record\_ID

HAVING count(\*) > 1;

--Remove Duplicates

WITH CTE AS (

SELECT \*,

ROW\_NUMBER() OVER (PARTITION BY [Record\_ID] ORDER BY (SELECT NULL)) AS rn

FROM Climate\_Change\_Combined\_Data

)

DELETE FROM CTE WHERE rn > 1;

-- Recheck for duplicates again

-- Check for Country names and their spellings

SELECT distinct Country

FROM Climate\_Change\_Combined\_Data

-- Fix the spelling in the name India

update Climate\_Change\_Combined\_Data

set Country = 'India'

where Country = 'Inda';

-- Check for null values

SELECT \*

FROM Climate\_Change\_Combined\_Data

WHERE

Record\_ID IS NULL OR

Date IS NULL OR

Country IS NULL OR

City IS NULL OR

Temperature\_C IS NULL OR

Humidity IS NULL OR

Precipitation\_mm IS NULL OR

Air\_Quality\_Index\_AQI IS NULL OR

Extreme\_Weather\_Events IS NULL OR

Climate\_Classification IS NULL OR

Climate\_Zone IS NULL OR

Biome\_Type IS NULL OR

Heat\_Index IS NULL OR

Wind\_Speed IS NULL OR

Wind\_Direction IS NULL OR

Season IS NULL OR

Population\_Exposure IS NULL OR

Economic\_Impact\_Estimate IS NULL OR

Infrastructure\_Vulnerability\_Score IS NULL;

--there are two null values; one in city value and another in Population\_Exposure value

--Assuming Population\_Exposure a random value

-- Update Population Exposure

update Climate\_Change\_Combined\_Data

set Population\_Exposure = 5275135

where Record\_ID = 'aus\_1338';

-- Update City

update Climate\_Change\_Combined\_Data

set City = 'Toronto'

where Record\_ID = 'cnd\_227';

-- Recheck for null values again

-- Monthly Temperature Trends

SELECT

DATENAME(MONTH, Date) AS Month\_Name,

AVG(Temperature\_C) AS Avg\_Temperature

FROM Climate\_Change\_Combined\_Data

GROUP BY MONTH(Date), DATENAME(MONTH, Date)

ORDER BY MONTH(Date);

-- Average temperature by country

SELECT Country,

AVG(Temperature\_C) AS Avg\_Temperature

FROM Climate\_Change\_Combined\_Data

GROUP BY Country

ORDER BY Avg\_Temperature DESC;

-- Extreme Weather Events by Month

SELECT

DATENAME(MONTH, Date) AS Month\_Name,

COUNT(\*) AS Event\_Count

FROM Climate\_Change\_Combined\_Data

WHERE [Extreme\_Weather\_Events] <> 'None'

GROUP BY MONTH(Date), DATENAME(MONTH, Date)

ORDER BY MIN(Date);

-- Country-wise Extreme Weather

SELECT Country,

COUNT(\*) AS Event\_Count

FROM Climate\_Change\_Combined\_Data

WHERE Extreme\_Weather\_Events <> 'None'

GROUP BY Country

ORDER BY Event\_Count DESC;

-- Extreme Weather Events by Temperature Range-Relationship

SELECT

CASE

WHEN Temperature\_C < 10 THEN 'Very Cold (<10°C)'

WHEN Temperature\_C BETWEEN 10 AND 15 THEN 'Cold (10-15°C)'

WHEN Temperature\_C BETWEEN 15 AND 20 THEN 'Moderate (15-20°C)'

WHEN Temperature\_C BETWEEN 20 AND 25 THEN 'Warm (20-25°C)'

ELSE 'Hot (>25°C)'

END AS Temperature\_Range,

Extreme\_Weather\_Events,

COUNT(\*) AS Event\_Count

FROM Climate\_Change\_Combined\_Data

WHERE Extreme\_Weather\_Events <> 'None'

GROUP BY

CASE

WHEN Temperature\_C < 10 THEN 'Very Cold (<10°C)'

WHEN Temperature\_C BETWEEN 10 AND 15 THEN 'Cold (10-15°C)'

WHEN Temperature\_C BETWEEN 15 AND 20 THEN 'Moderate (15-20°C)'

WHEN Temperature\_C BETWEEN 20 AND 25 THEN 'Warm (20-25°C)'

ELSE 'Hot (>25°C)'

END,

Extreme\_Weather\_Events

ORDER BY Temperature\_Range, Event\_Count DESC;

-- which cities are experiencing extreme weather events this week and what are their economic and population impacts?

SELECT

Country,

City,

Extreme\_Weather\_Events,

COUNT(\*) AS Event\_Type,

ROUND(AVG(Temperature\_C ), 1) AS Average\_Temperature,

SUM(Population\_Exposure) AS Total\_Population\_Exposure,

SUM(Economic\_Impact\_Estimate) AS Total\_Economic\_Impact,

ROUND(AVG(Infrastructure\_Vulnerability\_Score), 0) AS Average\_Vulnerability

FROM Climate\_Change\_Combined\_Data

WHERE DATE BETWEEN '2025-03-03' AND '2025-03-07'

AND Extreme\_Weather\_Events != 'None'

GROUP BY Country, City, Extreme\_Weather\_Events

ORDER BY Total\_Economic\_Impact DESC;

-- what are the top 5 cities with the highest air quality concerns and their associate risks?

--providing weekly reports

SELECT TOP 5

[Country],

[City],

ROUND(AVG([Air\_Quality\_Index\_AQI]), 0) AS [Average AQI],

COUNT(CASE WHEN [Air\_Quality\_Index\_AQI] > 200 THEN 1 END) AS [Days above 200 AQI],

SUM([Population\_Exposure]) AS [Total Population Exposure],

ROUND(AVG([Temperature\_C]), 1) AS [Average Temperature]

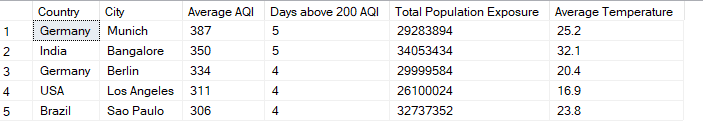
FROM Climate\_Change\_Combined\_Data

WHERE [Date] BETWEEN '2025-03-03' AND '2025-03-07'

GROUP BY [Country], [City]

HAVING AVG([Air\_Quality\_Index\_AQI]) > 100

ORDER BY [Average AQI] DESC;



-- Which biome types are most risk from extreme weather events this week?

WITH DistinctEvents AS (

SELECT DISTINCT

[Biome\_Type],

[Extreme\_Weather\_Events]

FROM Climate\_Change\_Combined\_Data

WHERE [Date] BETWEEN '2025-03-03' AND '2025-03-07'

AND [Extreme\_Weather\_Events] != 'None'

)

SELECT

c.[Biome\_Type],

COUNT(\*) AS [Total Records],

COUNT(DISTINCT c.[Country] + '-' + c.[City]) AS [Locations Affected],

COUNT(CASE WHEN c.[Extreme\_Weather\_Events] != 'None' THEN 1 END) AS [Extreme Weather Count],

(SELECT STRING\_AGG(d.[Extreme\_Weather\_Events], ', ')

FROM DistinctEvents d

WHERE d.[Biome\_Type] = c.[Biome\_Type]) AS [Event Types],

ROUND(AVG(c.[Temperature\_C]), 1) AS [Average Temperature],

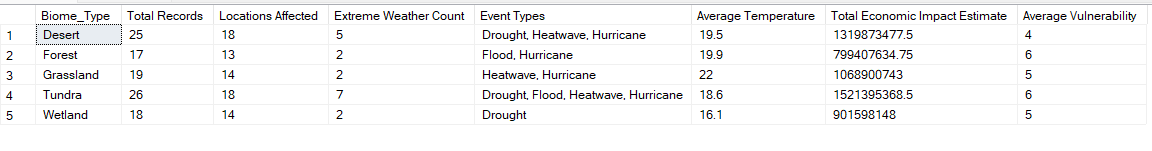
SUM(c.[Economic\_Impact\_Estimate]) AS [Total Economic Impact Estimate],

ROUND(AVG(c.[Infrastructure\_Vulnerability\_Score]), 0) AS [Average Vulnerability]

FROM Climate\_Change\_Combined\_Data c

WHERE c.[Date] BETWEEN '2025-03-03' AND '2025-03-07'

GROUP BY c.[Biome\_Type];



**TABLEAU**

Count of Extreme\_Weather\_Events

IF [Extreme Weather Events] <> "None" THEN 1 ELSE 0

END

Current Month Extreme\_Weather\_Event

IF DATENAME('month', [Date]) = [Select Month]

THEN [Count of Extreme\_Weather\_Events]

END

Previous Month Extreme\_Weather\_Event

IF DATENAME('month', [Date])=

case [Select Month]

WHEN 'January' THEN 'December'

WHEN 'February' THEN 'January'

WHEN 'March' THEN 'February'

WHEN 'April' THEN 'March'

WHEN 'May' THEN 'April'

WHEN 'June' THEN 'May'

WHEN 'July' THEN 'June'

WHEN 'August' THEN 'July'

WHEN 'September' THEN 'August'

WHEN 'October' THEN 'September'

WHEN 'November' THEN 'October'

WHEN 'December' THEN 'November'

END

THEN [Count of Extreme\_Weather\_Events]

END

% Difference EWE

(SUM([Current Month Extreme\_Weather\_Event]) - SUM([Previous Month Extreme\_Weather\_Event]))

/

SUM([Previous Month Extreme\_Weather\_Event])

% Difference EWE

(SUM([Current Month Extreme\_Weather\_Event]) - SUM([Previous Month Extreme\_Weather\_Event]))

/

SUM([Previous Month Extreme\_Weather\_Event])

Bad Percentage EWE

IF [% Difference EWE] > 0 THEN "▲ "

+

STR(ROUND([% Difference EWE] \* 100, 2)) + "%"

ELSE

""

END

Good Percentage EWE

IF [% Difference EWE] < 0 THEN "▼ " + STR(ROUND([% Difference EWE] \* 100, 2)) + "%"

ELSE

""

END

**Avg AQI**

AVG([Air Quality Index AQI])

Current Month AQI

IF DATENAME('month', [Date]) = [Select Month] THEN

{FIXED DATENAME('month', [Date]) :

AVG([Air Quality Index AQI])}

END

Previous Month AQI

IF DATENAME('month', [Date])=

case [Select Month]

WHEN 'January' THEN 'December'

WHEN 'February' THEN 'January'

WHEN 'March' THEN 'February'

WHEN 'April' THEN 'March'

WHEN 'May' THEN 'April'

WHEN 'June' THEN 'May'

WHEN 'July' THEN 'June'

WHEN 'August' THEN 'July'

WHEN 'September' THEN 'August'

WHEN 'October' THEN 'September'

WHEN 'November' THEN 'October'

WHEN 'December' THEN 'November'

END

THEN {FIXED DATENAME('month', [Date]) : AVG([Air Quality Index AQI])}

END

% Difference AQI

(AVG([Current Month AQI]) - AVG([Previous Month AQI]))

/ AVG([Previous Month AQI])

Bad Percentage AQI

IF [% Difference AQI] >= 0.03

THEN

IF [% Difference AQI] > 0

THEN "▲ " + STR(ROUND([% Difference AQI] \* 100, 2)) + "%" // Increase (bad)

ELSE "▼ " + STR(ROUND([% Difference AQI] \* 100, 2)) + "%" // Decrease (bad)

END

ELSE

""

END

Good Percentage AQI

IF [% Difference AQI] < 0.03

THEN

IF [% Difference AQI] > 0

THEN "▲ " + STR(ROUND([% Difference AQI] \* 100, 2)) + "%" // Increase (good)

ELSE "▼ " + STR(ROUND([% Difference AQI] \* 100, 2)) + "%" // Decrease (good)

END

ELSE

""

END

Avg Precipitation Intensity

AVG([Precipitation mm])

Current Month Precipitation Intensity

IF DATENAME('month', [Date]) = [Select Month] THEN

{FIXED DATENAME('month', [Date]) : AVG([Precipitation mm])}

END

Previous Month Precipitation Intensity

IF DATENAME('month', [Date]) =

case [Select Month]

WHEN 'January' THEN 'December'

WHEN 'February' THEN 'January'

WHEN 'March' THEN 'February'

WHEN 'April' THEN 'March'

WHEN 'May' THEN 'April'

WHEN 'June' THEN 'May'

WHEN 'July' THEN 'June'

WHEN 'August' THEN 'July'

WHEN 'September' THEN 'August'

WHEN 'October' THEN 'September'

WHEN 'November' THEN 'October'

WHEN 'December' THEN 'November'

END

THEN {FIXED DATENAME('month', [Date]) : AVG([Precipitation mm])}

END

% Difference Precipitation Intensity

(AVG([Current Month Precipitation Intensity]) - AVG([Previous Month Precipitation Intensity]))

/ AVG([Previous Month Precipitation Intensity])

Bad Percentage Precipitation Intensity

IF [% Difference Precipitation Intensity] <= -0.02 or [% Difference Precipitation Intensity] >= 0.02 THEN

IF [% Difference Precipitation Intensity] > 0

THEN "▲ " + STR(ROUND([% Difference Precipitation Intensity] \* 100, 2)) + "%"

ELSE "▼ " + STR(ROUND([% Difference Precipitation Intensity] \* 100, 2)) + "%"

END

ELSE

""

END

Good Percentage Precipitation Intensity

IF [% Difference Precipitation Intensity] > -0.02 AND [% Difference Precipitation Intensity] < 0.02 THEN

IF [% Difference Precipitation Intensity] > 0

THEN "▲ " + STR(ROUND([% Difference Precipitation Intensity] \* 100, 2)) + "%"

ELSE "▼ " + STR(ROUND([% Difference Precipitation Intensity] \* 100, 2)) + "%"

END

ELSE

""

END

Avg. Temperature

AVG([Temperature C])

Current Month Temperature

IF DATENAME('month', [Date]) = [Select Month] THEN

{FIXED DATENAME('month', [Date]) : AVG([Temperature C])}

END

Previous Month Temperature

IF DATENAME('month', [Date]) =

case [Select Month]

WHEN 'January' THEN 'December'

WHEN 'February' THEN 'January'

WHEN 'March' THEN 'February'

WHEN 'April' THEN 'March'

WHEN 'May' THEN 'April'

WHEN 'June' THEN 'May'

WHEN 'July' THEN 'June'

WHEN 'August' THEN 'July'

WHEN 'September' THEN 'August'

WHEN 'October' THEN 'September'

WHEN 'November' THEN 'October'

WHEN 'December' THEN 'November'

END

THEN {FIXED DATENAME('month', [Date]) : AVG([Temperature C])}

END

% Difference Temperature

(AVG([Current Month Temperature]) -

AVG([Previous Month Temperature]))

/

AVG([Previous Month Temperature])

Bad Percentage Temperature

IF [% Difference Temperature] >= 0.03 OR [% Difference Temperature] <= -0.03

THEN

IF [% Difference Temperature] > 0

THEN "▲ " + STR(ROUND([% Difference Temperature] \* 100, 2)) + "%"

ELSE "▼ " + STR(ROUND([% Difference Temperature] \* 100, 2)) + "%"

END

ELSE

""

END

Good Percentage Temperature

IF [% Difference Temperature] > -0.03 AND [% Difference Temperature] < 0.03

THEN

IF [% Difference Temperature] > 0

THEN "▲ " + STR(ROUND([% Difference Temperature] \* 100, 2)) + "%"

ELSE "▼ " + STR(ROUND([% Difference Temperature] \* 100, 2)) + "%"

END

ELSE

""

END

Temperature Variability

STDEV([Temperature C])

Current Month Temperature Variability

IF DATENAME('month', [Date]) = [Select Month] THEN

{FIXED DATENAME('month', [Date]) : STDEV([Temperature C])}

END

Previous Month Temperature Variability

IF DATENAME('month', [Date]) =

case [Select Month]

WHEN 'January' THEN 'December'

WHEN 'February' THEN 'January'

WHEN 'March' THEN 'February'

WHEN 'April' THEN 'March'

WHEN 'May' THEN 'April'

WHEN 'June' THEN 'May'

WHEN 'July' THEN 'June'

WHEN 'August' THEN 'July'

WHEN 'September' THEN 'August'

WHEN 'October' THEN 'September'

WHEN 'November' THEN 'October'

WHEN 'December' THEN 'November'

END

THEN {FIXED DATENAME('month', [Date]) : STDEV([Temperature C])}

END

% Difference Temperature Variability

(AVG([Current Month Temperature Variability])

- AVG([Previous Month Temperature Variability]))

/

AVG([Previous Month Temperature Variability])

Bad Percentage Temperature Variability

IF [% Difference Temperature Variability] >= 0.01 THEN

IF [% Difference Temperature Variability] > 0

THEN "▲ " + STR(ROUND([% Difference Temperature Variability] \* 100, 2)) + "%"

ELSE "▼ " + STR(ROUND([% Difference Temperature Variability] \* 100, 2)) + "%"

END

ELSE

""

END

Good Percentage Temperature Variability

IF [% Difference Temperature Variability] < 0.01 THEN

IF [% Difference Temperature Variability] > 0

THEN "▲ " + STR(ROUND([% Difference Temperature Variability] \* 100, 2)) + "%"

ELSE "▼ " + STR(ROUND([% Difference Temperature Variability] \* 100, 2)) + "%"

END

ELSE

""

END

**POWER BI DATE TABLE**

DateTable =

ADDCOLUMNS (

CALENDAR (DATE(2020,1,1), DATE(2025,12,31)), -- Adjust date range

"Year", YEAR([Date]),

"Month Number", MONTH([Date]),

"Month", FORMAT([Date], "MMMM"),

"Year-Month", FORMAT([Date], "YYYY-MM"),

"Quarter", "Q" & FORMAT([Date], "Q"),

"Day", DAY([Date]),

"Weekday", FORMAT([Date], "dddd")

)