

MADE

Analysis of the impact of Extreme Weather Events on the USA

Richard Heinz

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- 1. Introduction**
- 2. Data Outputs**
- 3. Data Analysis**
- 4. Conclusion**

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Background

- Increase in **extreme weather events** like storms, floods, and tornadoes across the USA.
- Key economic concern: their impact on **GDP** and **financial resources**.

Research question

- To what extent do extreme weather events such as storms, floods and tornadoes impact the GDP of the United States and consequently the availability of financial resources?

Objective

- Analyze **historical data of storm events** in the years 1999 to 2023
- Analyze **historical data of GDP and other financial factors** in the years 1999 to 2023
- Provide actionable insights

1. Introduction

2. Data Outputs

3. Data Analysis

4. Conclusion

Key Facts

- Covers extreme weather events (1999–2024).
- Details:
 - State, date, event type.
 - Injuries, fatalities, and financial damages.
- Financial damages:
 - Abbreviated formats (e.g., 50K = \$50,000).
 - Challenges with NULL values (missing or \$0?).

Data Structure

- Stored in SQLite tables.
- Uniform yearly structure (1999–2024).
- Includes SOURCE column for context.

Challenges for Analysis

Careful handling of NULL values is critical to avoid biased results.

Bureau of Economic Analysis: GDP by State

Key Facts

- Comprehensive economic dataset (1999–2023).
- Includes:
 - GDP, personal income, employment statistics.
 - Real and current dollar statistics.
- Data covers both national and state levels for comparative analysis.

Data Structure

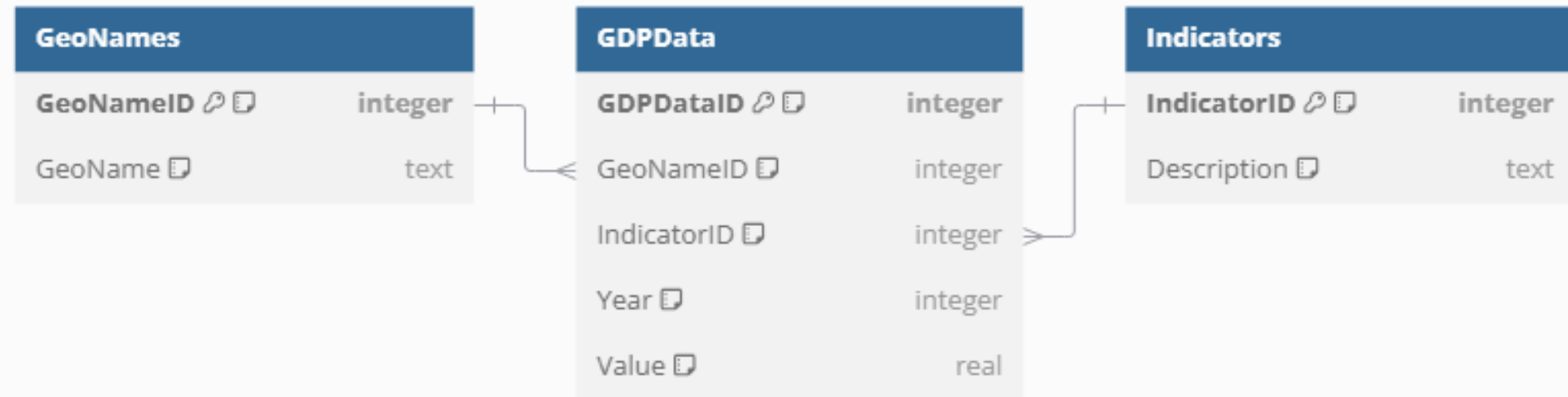
- Organized in three interlinked SQLite tables:
 - **GeoNames:** Locations.
 - **Indicators:** Economic categories (e.g., GDP, income).
 - **GDPData:** Annual percentage changes.

Challenges

- Initial rows contain irrelevant supplementary information.
- Geographic names must repeat for yearly mapping.
- Presence of NA values complicates correlation analysis.

Bureau of Economic Analysis: GDP by State - structure

Database structure of the NOAA-Data



Example

- Real GDP in Alabama increased by 5.1% based on GeoNameID and IndicatorID

1. Introduction

2. Data Outputs

3. Data Analysis

4. Conclusion

Analysis Overview

- Correlation analysis between financial damages (NOAA) and economic indicators (BEA).
- Focus on Real GDP percentage change (inflation-adjusted).
- Additional metrics: Real per capita personal income, Real PCE.

Key Variables

- **X: Financial Damages** from NOAA (property + crop damages).
- **Y: Real GDP** (primary), Real personal income, and Real PCE.

Analysis Focus

- **Real GDP** as the main indicator of economic performance.
- **Real per capita personal income** to gauge average income changes.
- **Real PCE** to assess purchasing power and consumption trends.

State-Level Correlations

- **New Hampshire:** Moderate negative correlation (-0.54), indicating that higher financial damages from extreme weather events are linked to a decrease in Real GDP.
- **Kansas:** Moderate positive correlation (+0.42), suggesting that in Kansas, higher financial damages tend to coincide with an increase in Real GDP.

Nationwide Correlation

- Nationwide, the correlation is weakly negative (-0.16), pointing to a slight negative impact of extreme weather events on Real GDP across all states.

Additional Metrics

- **Real personal income** showed a weak positive correlation of 0.29, suggesting limited impact on income levels.
- **Real PCE** had a similarly weak positive correlation of 0.18, indicating a minor relationship between extreme weather damages and consumer spending.

Correlation Examples

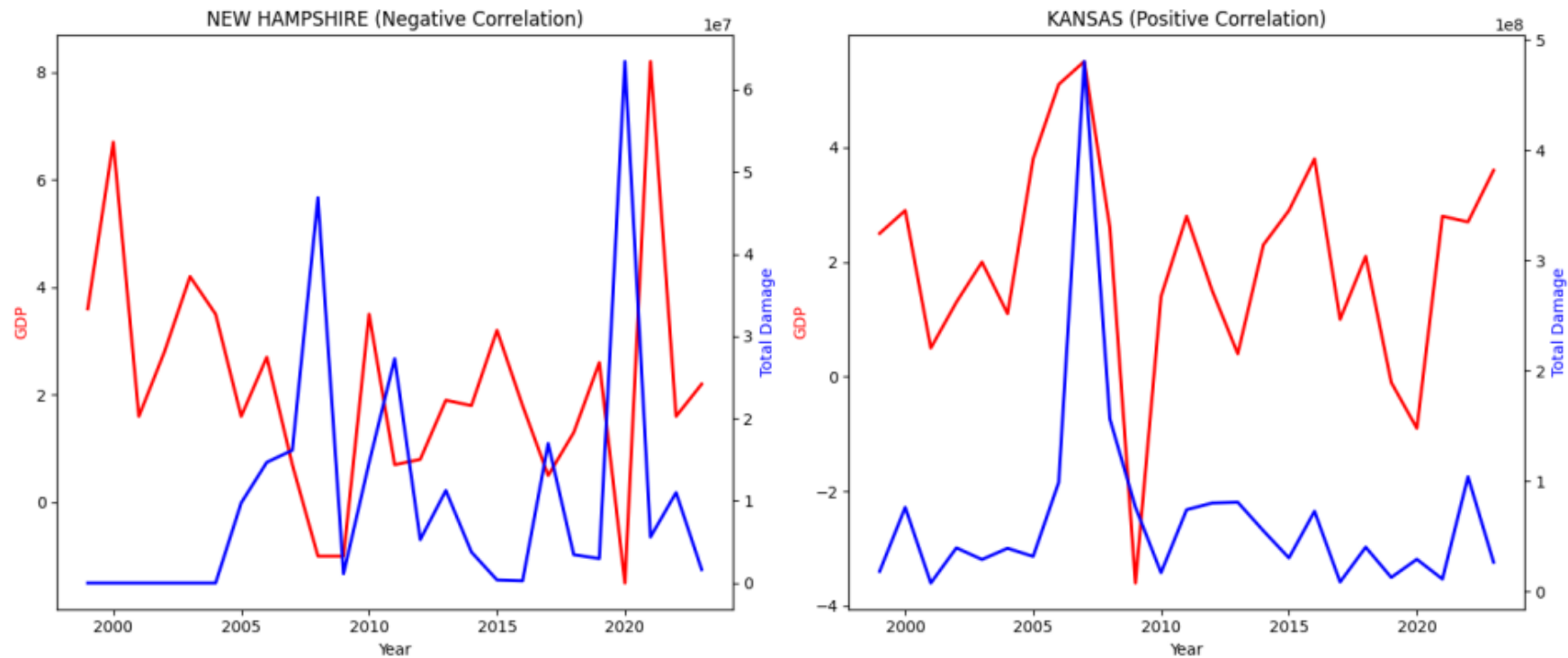


Abbildung 3: Correlation: New Hampshire, Kansas (Source: Own representation).

1. Introduction
2. Data Outputs
3. Data Analysis
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Key Insights

- Extreme weather impacts vary across states, with different correlations to economic indicators.
- **New Hampshire:** Negative correlation (-0.54), indicating a negative impact on the economy.
- **Kansas:** Positive correlation (+0.42), suggesting higher financial damages do not necessarily hinder economic growth, possibly due to better preparedness.

General Findings

- Nationwide, weak negative correlation (-0.16) suggests a slight economic impact.
- Low positive correlations with Real per capita personal income and Real PCE contradict intuition, pointing to possible long-term effects.

Limitations & Next Steps

- Limitations: Missing data, variability in state responses.
- Need for deeper exploration of regional resilience mechanisms and demographic factors (e.g. state size, population).

Thank you

Thank you for your attention!