



The Relationship Between Energy Attitudes and Flood-Climate Attribution in Central Appalachia



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Introduction

- Central Appalachia has experienced ~20 federally declared floods from 2013–2023 and a 35% increase in heavy rainfall days, but climate skepticism is still very prevalent (Gounaridis et al., 2024).
- Gounaridis et al. (2024) identified "triple exposure" (flood risk + social vulnerability + climate skepticism), to be strongest in Appalachia.
- Qualitative research identifies deep distrust of climate governance rooted in the region's extractive industry history (Khan et al., 2025; Poling & Shealy, 2024).
- This study asks: do objective hydrological measures or fossil fuel attitudes better predict flood-climate attribution across 236 counties in KY, NC, OH, TN, VA, and WV?

Research Questions

- Does direct environmental exposure (drought severity, heavy precipitation) predict flood-climate attribution in Central Appalachian counties?
- Does support for offshore drilling expansion predict flood-climate attribution?
- Which is the stronger predictor?

Methods

Sample

- 236 counties across KY, NC, OH, TN, VA, and WV.
- Data sources: Yale Program on Climate Change Communication (YPCCC), NOAA Palmer Drought Severity Index, annual precipitation (2024).

Measures

- **attrflood** — % believing global warming causes floods.
- **drilloffshore** — % supporting offshore drilling expansion.
- **PDSI** — Palmer Drought Severity Index (2024).
- **precipitation** — total annual inches, 2024.
- **Analysis:** multiple linear regression with flood attribution as the response.

Results

Bivariate

- Drought severity (PDSI) shows no meaningful relationship with flood attribution ($Beta = -0.27$, $p = 0.465$, $R\text{-squared} = 0.002$).
- The weak PDSI–attribution pattern holds across all precipitation levels.
- Most counties fall in the 30–50% attribution range (Fig. 1).

Multivariate

- Offshore drilling support is a strong negative predictor ($Beta = -1.267$, $p < 0.001$, $R\text{-squared} = 0.68$).
- Precipitation reaches significance in the full model ($Beta = 0.231$, $p < 0.001$).
- PDSI remains non-significant ($Beta = -0.334$, $p = 0.199$).
- Full model $R\text{-squared} = 0.740$ ($n = 236$ counties).
- Offshore drilling attitudes alone explain 68% of variance, adding precipitation + PDSI pushes $R\text{-squared}$ to 74%.

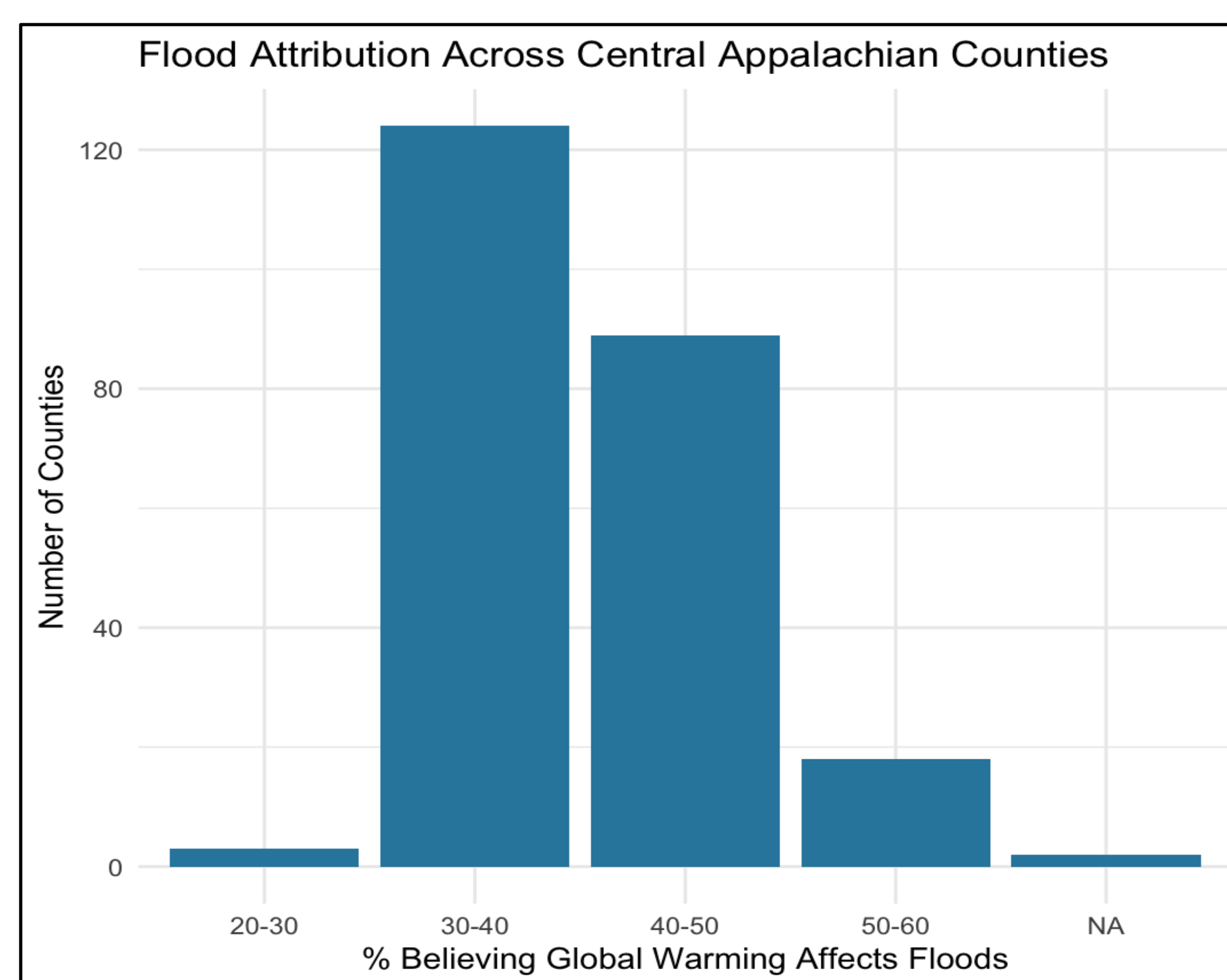


Figure 1: Distribution of flood attribution across 236 Central Appalachian counties. Most fall in the 30–50% range.

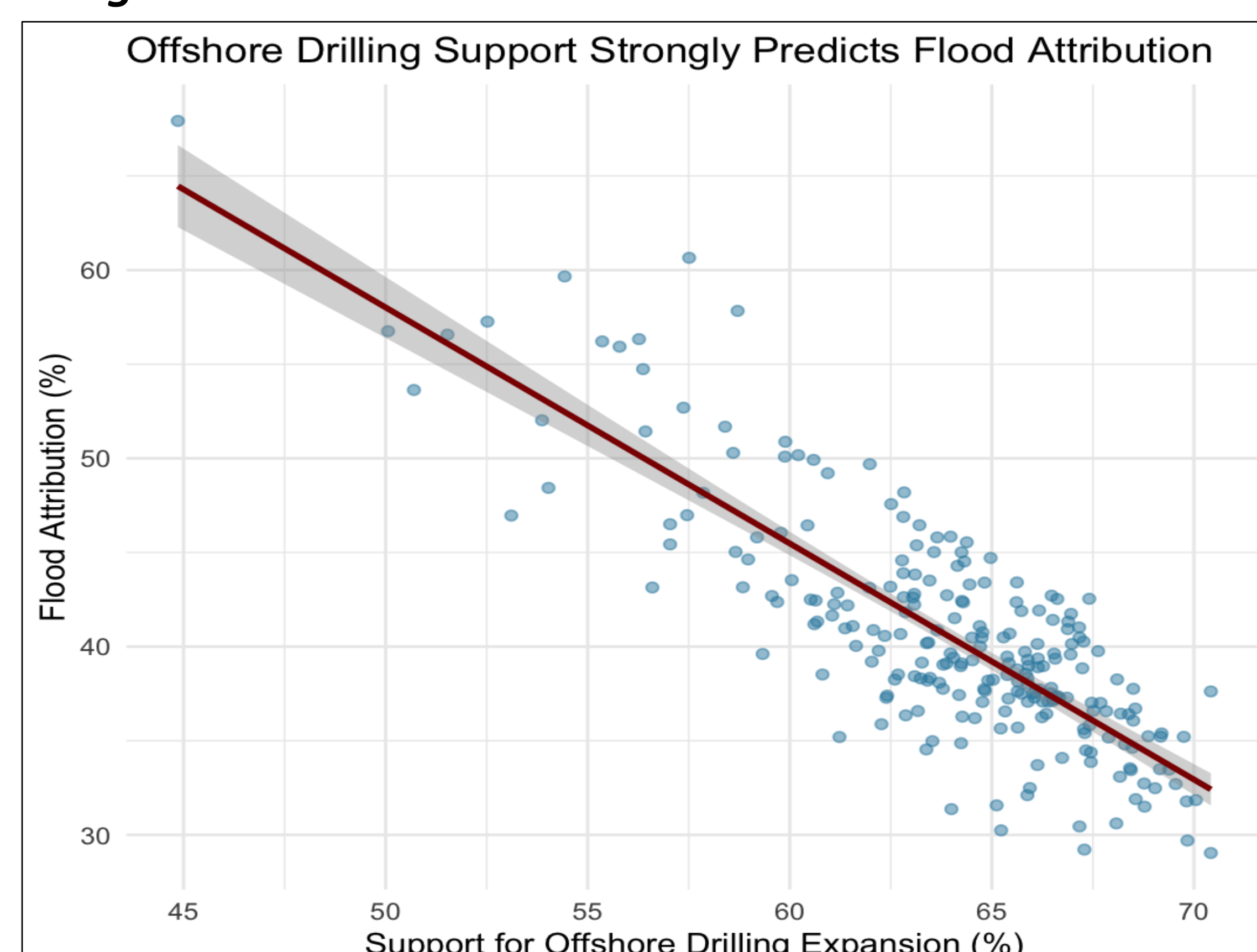


Figure 2: Support for offshore drilling is a strong negative predictor of flood attribution ($Beta = -1.267$, $p < 0.001$, $R\text{-squared} = 0.68$).

Key Finding: Offshore drilling attitudes explain 74% of the variance in flood attribution — a far larger effect than any environmental variable tested.

Discussion

- Environmental conditions don't drive climate change attitudes; energy attitudes do. Drought or rainfall level explains almost nothing ($R\text{-squared} = 0.002$); offshore drilling attitudes explain 74% of variance.
- Consistent with the Appalachian literature: extractive industry identity structures how people interpret environmental events. Flooding isn't processed through a climate lens but through a cultural one.
- Residents aren't disconnected from their environment. The interpretive frame is shaped by cultural and economic identity, not the weather.
- Limitations: ecological (county-level) data, drilloffshore likely correlates with political affiliation.
- Conclusion: sociocultural and economic identity, not environmental exposure, is the dominant driver of climate attribution. Economic framing may be more effective than with environmental data alone.

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