

# The Mobilization of Contaminants from Superfund Sites to Adjacent Communities due to Severe Water Events: A Systematic Literature Review

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## Introduction

Toxic sites are vulnerable to the effects of climate change, including the increased severity of hurricanes and other flood events

- There are 1327 Superfund sites on the NPL
- Severe health impacts of toxicants investigated; cancer, respiratory disease, neurological dysfunction
- Toxicants can be resuspended and transported by flood events
- Hurricanes and flood events are more severe under climate change and are projected to continue in this trajectory
- Superfund distribution is an environmental injustice

## Objectives

To assess the literature investigating the impact of hurricanes and flooding on concentration of toxicants in environmental media in communities adjacent to superfund sites

## Methods

- Utilized the Navigation Guide (Woodruff and Sutton, 2010) and methods outlined by Johnson et al. (2014)
- Search of PubMed, SCOPUS, ProQuest Environmental Sciences utilizing relevant exclusion criteria

## Results

**Included Studies.** 5 unique records identified

### Risk of Bias.

Low Risk
Probably Low Risk
Probably High Risk
High Risk

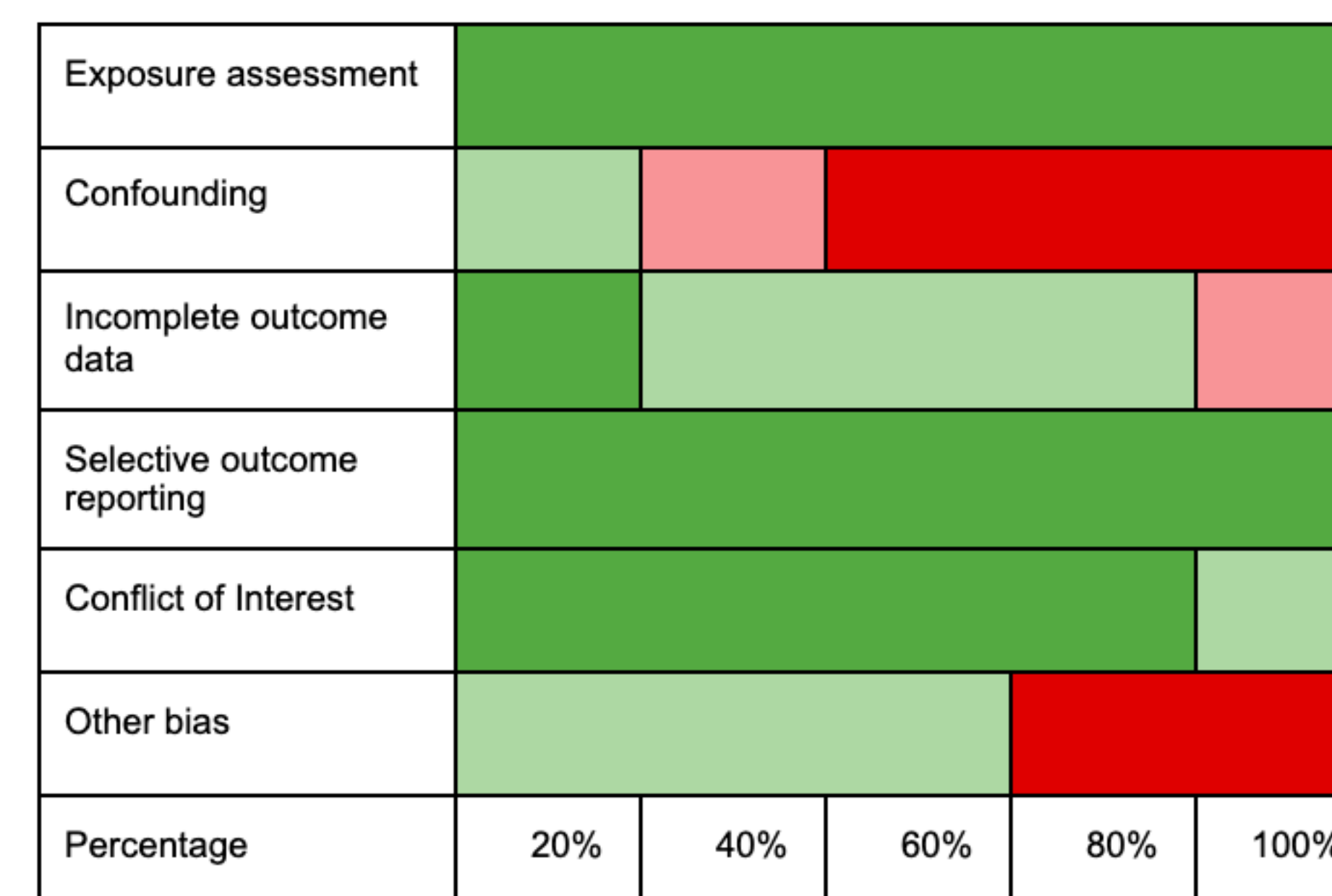


Figure 3. Summary of the risk of bias tables, by study (A) and by percentage of rating (B)

### Quality of Evidence.

Downgraded for high risk of bias and imprecision across the literature

Rating: Low

### Strength of Evidence.

Quality: Inadequate  
Direction: Sufficient  
Confidence: Inadequate  
Other: Limited

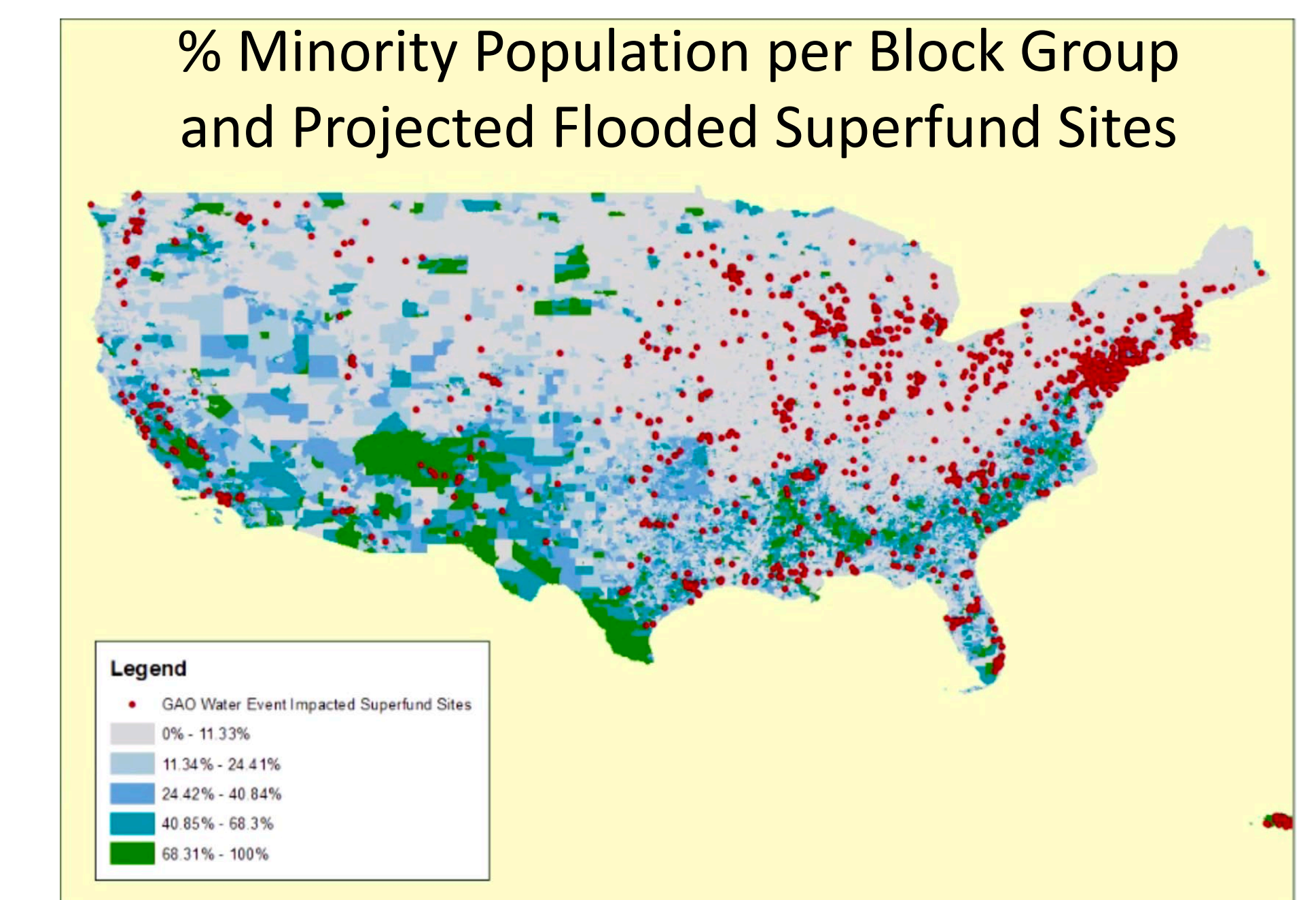
Rating: Limited

## Conclusions

- Literature suggests a synergistic effect between Superfund sites, severe water events, and the mobilization of contamination to neighboring communities - Increased exposure?

## Recommendations

- Monitoring of environmental media within a predetermined radius of the superfund site
- Stringent permits for overburdened and systematically disadvantaged communities
- Expediated cleanup and a clear timeline
- Emphasis on including climate projections in risk assessment



## Studies Reviewed

- Islam, M. S., Bonner, J. S., Fuller, C. S., & Kirkey, W. (2016) <https://doi.org/10.1089/ees.2015.0564>
- Kiaghadi, A., & Rifai, H. S. (2019). <https://doi.org/10.1021/acs.est.9b00792>
- Lin, Y., Sevillano-Rivera, M., Jiang, T., Li, G., Cotto, I., Vosloo, S., Carpenter, C. M. G., Larese-Casanova, P., Giese, R. W., Helbling, D. E., Padilla, I. Y., Rosario-Pabón, Z., Vélez Vega, C. <https://pubs.acs.org/doi/10.1021/acs.est.0c01655>
- Mandigo, A. C., DiScenza, D. J., Keimowitz, A. R., & Fitzgerald, N. (2016). <https://doi.org/10.1007/s10653-015-9776-y>
- Personna, Y. R., Geng, X., Saleh, F., Shu, Z., Jackson, N., Weinstein, M. P., & Boufadel, M. C. (2015). <https://doi.org/10.1007/s12665-014-3539-4>