TOXIC TIDES

Sea Level Rise, Hazardous Sites, and Environmental Justice in California

PROJECT BACKGROUND

Over three feet of sea level rise (SLR) are expected by the end of the century if little is done to slow climate change.

In California, the areas projected to experience flooding events by 2100 are home to **145,000 residents**, as well as over **400 hazardous facilities** including power plants, refineries, industrial facilities, and hazardous waste sites. SLR poses risks for such facilities experiencing flooding events that can potentially **expose nearby residents to hazardous pollutants**.

Because many of these facilities are **disproportionately located in poor communities and communities of color**, climate resilience strategies must address the disproportionate impacts of SLR and associated flooding threats faced by environmental justice communities.

Although prior research in California has focused on the risks of SLR to property, little work has holistically examined its **environmental health and social equity implications statewide.** With an adequate understanding of the intersection of SLR, hazardous facilities, and environmental justice, **targeted action can prevent the most adverse impacts.**

PROJECT GOALS

Characterize the threats posed by sea level rise and the flooding of hazardous sites to socially disadvantaged populations

Create an online mapping tool that visually depicts toxic facilities at risk of flooding due to SLR and associated socioeconomic conditions
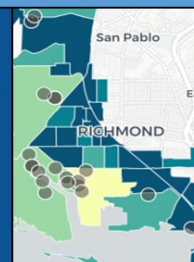
Share findings with advocates and decision-makers in order to protect vulnerable communities through current and emerging climate resilience policies

KEY OUTCOMES & FINDINGS

Disadvantaged communities[1] are **over 5 times more likely**[2] to live within 1km of one or more facilities at risk of flooding in 2050, and **over 6 times in 2100.**

Created by Fatemah Manji from Noun Project

The Toxic Tides website includes a series of maps showing hazardous facilities projected to be at risk of flooding in the years 2050 and 2100, as well as demographic information of the communities nearby.

Case studies of environmental justice communities are also highlighted.

1. Communities with CalEnviroScreen 4.0 scores in the top 25th percentile as designated by the CalEPA
2. Compared to the general population

Our analysis also found that:

Out of a total of 10,544 hazardous facilities in low lying coastal areas, **440 are projected to be at risk of at least one flood event per year by 2100.**[1]

The majority of at-risk facilities are in 5 counties: **Alameda, Orange, San Mateo, Los Angeles, and Contra Costa.**

POLICY APPLICATIONS

This project seeks to promote resiliency of vulnerable communities that may be impacted by SLR through:

- Supporting **equitable implementation** of state agency climate resilience and adaptation programs already underway and coming down the pipeline;
- Shaping **local and regional coastal planning** efforts to address risks posed by SLR;
- Informing the state's approach to **defining "vulnerable communities"**, to guide emerging climate resilience legislation or executive orders;
- Advancing **community advocacy efforts** by depicting priority SLR risks and providing information about potential solutions and programs to address relevant risk.

COLLABORATIVE PARTNERSHIP MODEL

Toxic Tides is a collaborative effort among **community-based organizations** and **academic researchers.**

Community advocates participated in an advisory committee to provide **iterative guidance and feedback to researchers,** including overall study design, development of measures and indicators, data analysis, usability of the online mapping tool, and dissemination strategy.

Community-Based Partners:

- Asian Pacific Environmental Network
- Central Coast Alliance for a Sustainable Economy
- Physicians for Social Responsibility - Los Angeles
- Public Health Institute
- WE ACT for Environmental Justice

Research Team:
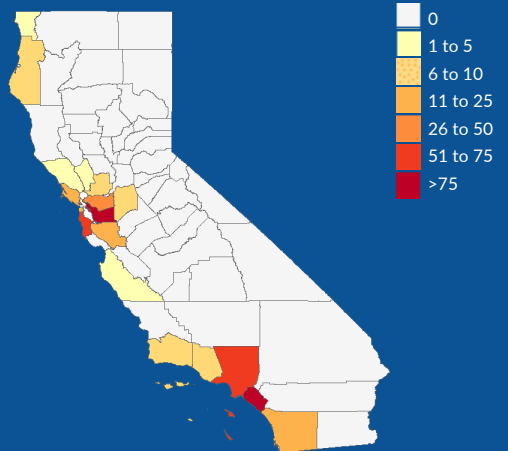
- UC Berkeley Sustainability and Health Equity Lab
- UC Los Angeles, Fielding School of Public Health
- Climate Central

To learn more and explore the interactive maps and case studies, visit **sites.google.com/berkeley.edu/toxictides**
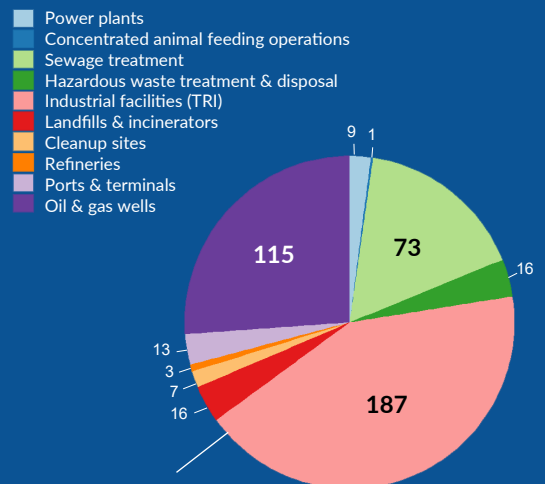
1. Under a high greenhouse gas emissions scenario (RCP 8.5)

PROJECTED NUMBER OF FACILITIES AT RISK OF FLOODING DUE TO SLR IN 2100 UNDER HIGH EMISSIONS SCENARIO (RCP 8.5)

By County:

- 0
- 1 to 5
- 6 to 10
- 11 to 25
- 26 to 50
- 51 to 75
- >75

By Facility Type:

- Power plants
- Concentrated animal feeding operations
- Sewage treatment
- Hazardous waste treatment & disposal
- Industrial facilities (TRI)
- Landfills & incinerators
- Cleanup sites
- Refineries
- Ports & terminals
- Oil & gas wells

9 1
73
16
187
16
7
3
13
115

TRI facilities are typically involved in manufacturing, metal mining, electric power generation, chemical manufacturing and hazardous waste treatment. They report emissions to US EPA, and make, process or use large quantities of toxic substances.

Iterative Feedback Process:

Research team proposes/creates/revises

Advisory committee tests and discusses output

Advisory committee provides feedback to research team from community-focused lens