TOXIC STORM: THE CHALLENGE AND SOLUTIONS TO HAZARDOUS MATERIALS IN INDUSTRIAL FLOODPLAINS

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What is the practice and law of coastal adaptation for sea level rise and climate change to deal with industrial hazards?

Looked at FEMA regulations, exemplary state law, and case study municipalities

Land Use Planning and legal perspective
Historically, the advantages of locating on coastlines for strategic harbors was so significant that the risks were minor compared to the benefits. Locating settlements near a river or harbor provided communities with access to transportation and trade, territorial control, a supply of fresh water and a place to release sanitary effluent, and for food supply.

Urban waterfronts developed from shipping ports into places where heavy industry located, along with water-dependent uses such as sanitary sewer and power plants (Balsley 2012).
Cities have promoted redevelopment of their waterfronts into locations for recreation and tourism.

The legacy of industry of heavy industry has left behind a surfeit of brownfield sites.
Despite this overwhelming trend toward cleaning up and reusing urban coastlines, some cities have chosen to promote the retention of industry as a social justice and economic diversity strategy.

Active industry and the historic legacy of contamination pose the threat of toxic releases caused by coastal flooding.
As Lester and Rabe (2010), explained: “as the climate-change related extreme weather events are becoming more frequent and more intense, they are posing a significant threat to…many Superfund sites. The strong winds of hurricanes and tornadoes can cause significant damage such as disrupting contaminated soils and moving waste barrels long distances, or damaging protective liners covering dangerous toxic waste dumps. Flooding can dislodge buried waste, displace chemicals stored above ground, and spread contamination in soil.”
PRESENT RISKS

- Significant Maritime Industrial Areas, or SMIA’s, are zones designed to encourage the clustering or concentration of heavy industrial and polluting infrastructure uses.
- More than 600,000 people live and work in six communities in New York City designated as SMIA’s.
- These six SMIA’s are all in storm surge zones.
- NYC-EJA launched the Waterfront Justice Project (WJP) in 2010, New York City’s first citywide community resiliency campaign.
The U.S. Gulf Coast, particularly from Louisiana west to Texas, is vulnerable to toxic storms because it is heavily industrialized with petrochemical plants including oil refineries, terminals, gas wells and oil platforms, and the region is subject to frequent and severe tropical cyclones.
Hurricane Katrina resulted in over 200 onshore chemical releases and caused five major oil spills that released over 500,000 gallons each.

Caused over 600 hazardous materials releases from offshore platforms and pipelines.

Storm surge caused the majority of the impacts, and failure of storage tanks was the most frequently cited cause of spills.

These many large and small events had widespread health implications for residents.
SUPERSTORM SANDY'S IMPACT
Bayway Spill - Linden, NJ

Surge caused an oil storage tank to float off its base and release 1.05 million gallons of mixed crude to escape into surrounding residential area.

Over 1700 homes and numerous waterways were affected.

Testing showed increased levels of polycyclic aromatic hydrocarbons, total petroleum hydrocarbons, and arsenic.
The second major spill occurred at the Kinder Morgan Terminal in Carteret, N.J.

An empty tank crashed into a tank filled with biodiesel, causing a spill into Rum Creek, which flows into the Arthur Kill.

The United States Coast Guard (USCG) recovered 780,000 gallons of an oil-water mixture from the site.
A tank ruptured at the Motiva - Shell Oil and Saudi Refining storage facility in Sewaren, New Jersey.

Caused 336,000 gallons of diesel fuel to leak into the creek, which flows in to the Arthur Kill.

The spill was labeled "the largest fuel or oil spill in New Jersey in perhaps a decade or more."
Many more small events

Large spills were contained and remediated but hundreds of other events went unreported.

There is a paucity of documentation of what chemicals were released.

Post-storm environment creates many challenges that are sadly more acute than chemical releases, and emergency responders are fully occupied with immediate recovery needs.

Challenges make long-term planning to reduce spills an imperative.
Generally absent

FEMA/NFIP minimum standards do not require regulation of the manufacture or storage of hazardous materials nor require regulation of potentially dangerous uses such as petroleum storage facilities, nuclear power plants, chemical plants or sewage treatment facilities in floodplains
FEMA CRS

- Provides incentives to regulate some hazardous uses and materials.

- Credits are provided for prohibition of indoor and outdoor storage of hazardous materials or if codes require hazardous materials to be stored above the base flood elevation.

- Greater credits are earned if a community prohibits outdoor storage of all materials.
The 1999 regulations implementing its Coastal Zone Act prohibit new industrial uses in the entirety of its coastal zone.

The law prohibits:
New heavy industry
Expansion of any non-conforming uses
Offshore gas, liquid, or solid bulk product transfer facilities
Conversion of an existing unregulated, exempted, or permitted facility to a heavy industry use
Bulk product transfer facilities and pipelines; construction, establishment, or operation of offshore gas, liquid, or solid bulk product transfer facilities;
New tank farms larger than 5 acres
Lewes’ flood ordinance pertaining to its high hazard zone prohibits the manufacturing, dumping, disposal or storage, except as authorized under the NPDES of “pesticides, domestic and industrial waste, radioactive materials, petroleum products, except household storage, or other hazardous materials which, if flooded, would pollute coastal waters;” as well as storage of materials which could be swept onto other properties.
Prohibits sanitary landfills, junkyards, outdoor storage of inoperable vehicles, manufactured homes, surface mines, industrial wastes, and outdoor storage of buoyant, flammable, or explosive equipment or materials.

Law prohibits the manufacture, bulk storage, or distribution of petroleum, chemical, asphalt, or any hazardous materials, including radioactive, biologically accumulative poisons, and substances highly lethal to mammalian life.

Enforcement is through the business license process. Inventory of hazardous materials correlated with the fire department Business licenses are rejected for improper storage of hazardous materials in the floodplain.
Floodplain law prohibits storage or processing of potentially flammable or explosive materials that could injure human animal or plant life.

Exceptions are provided if the material is not subject to damage from major floods, can be removed in advance of a storm, or if it can be firmly anchored to resist flotation.

Prohibits "maintenance, use, or sale of specific hazardous substances listed in 40 CFR 116..." including all petroleum products in "floodplains, floodways, wellheads, the Cockeysville Formation, drainageways, recharge areas, steep slopes, critical natural areas, wetlands, riparian buffers and sinkholes.

The only exception is for replacement of existing storage facilities, which are further restricted to only those upgrades required by law.

The county also prohibits any new development in floodplains.
When it comes to small businesses structures, only about 4% of NFIP policies cover small business structures. Why? Because Congress never wanted to provide more than very limited coverage amounts for “small” businesses, although in recent times such coverage limits have been increased to $500k for building and contents each.

NYC’s recent study suggests only 18% of industrial businesses even maintain flood insurance - there is a significant gap in coverage.
NFIP should encourage or mandate federal flood insurance for industrial businesses and extend that coverage to major damage and losses to the environment and communities.

But it should do so subject to similar mitigation standards that accompanied the first NFIP program.
CONCLUSIONS

• NFIP should revisit its original objectives to reduce risk and encourage sound planning in flood zones, by updating minimum standards to more strictly regulate industry in floodplains

• Regulation of manufacture and storage of hazardous materials and potentially dangerous uses should be addressed by the new coverages

• It should consider a ban on permitting any new industrial development in floodplains and discourage communities from allowing heavy industry in these areas through CRS credits
• CRS could better incentivize ordinances that target hazardous and toxic materials specifically.

• CRS should triage material types based on relative risk for release and historical contamination.
• NYC should move toward rezoning industrial floodplains for mixed use, performance-based clean manufacturing, commercial and residential space, at high enough densities to compensate for brownfields cleanup, creation of riparian buffers, parklands, and river and shorefronts.

• Development should not be encouraged in floodplains anywhere except where such development can reduce overall risk to humans and the environment.
New development should incorporate floodproofing technologies and strategies.

Other strategies, such as using transfer of development rights and purchase of development rights can also encourage creation of natural buffers and public access open space along existing industrial waterways.
Thank you for your attention!

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