C O M M E N T

Applying a FAMiliar Question of Climate Change Scope and Scale: Financial Assurance Mandates and Coastal Risk Management

by Catherine E.B. McCall

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I. Introduction

Just as our coasts have been defined and shaped by their surrounding lands and waters, the future scale and scope of climate change impacts in any one location will-in part-be defined by geography and surrounding landscape. In Preventing Industrial Disasters in a Time of Climate Change: A Call for Financial Assurance Mandates, Mr. Arnold presents a case for how Financial Assurance Mandates (FAMs) such as insurance or surety bonding could be utilized effectively to reduce the risk communities face from climate-driven impacts that result in coastal industrial disasters. Onshore and offshore, our coasts and oceans support a wide variety of livelihoods, economies, and natural resources. According to the National Oceanic and Atmospheric Administration's Economics: National Ocean Watch data, the coastal zone of the United States contributed \$7.9 trillion toward the Gross Domestic Product (GDP) and supported 54.6 million jobs in 2014.1 If the nation's coastal counties comprised an individual country, it would have the third-largest GDP in the world behind the United States and China.² Coastal industries are particularly vulnerable to episodic storm events, and chronic hazards related to flooding, inundation and shoreline erosion will continue to be driven and exacerbated by climate change. Other climate impacts not associated only or so closely with coastal³ environments—such as temperature fluctuations or extreme heat, drought, precipitation changes, and wildfire—could also pose significant direct and indirect risks to coastal industries that could result in industrial disasters. The author's arguments for how FAMs could help to reduce regulatory and enforcement burdens related to climate-driven industrial disasters could be a positive step toward focusing limited public resources on advancing other climate actions and limiting climate risk and impact costs in other sectors.

II. Industrial Development and Our Coasts

The author bases much of his argument for climate FAMs on the premise that they can be used to reduce community and environmental risk when applied primarily to new industrial development in vulnerable coastal areas. As nonwater dependent uses of our coastlines increase, the population living, recreating and working by our coasts also grows, as do the investments in transportation and other infrastructure. In 2010, 123.3 million people, or 39% of the nation's population, lived in counties bordering the shoreline, and by 2020 this number is expected to increase by an additional 10 million people, or 8%.⁴ Therefore, the author is correct in stating that the associated risk from industrial accidents resulting from accelerating climate change, rising sea levels, and increasingly extreme weather is expansive and growing. However, applying FAMs primarily to new industrial development may limit their scope

^{*}The opinions and statements outlined in this Comment are the personal opinions of the author and should not be interpreted to represent any opinion other than those of the author.

NAT'L OCEANIC & ATMOSPHERIC ADMIN. (NOAA) OFFICE FOR COASTAL MGMT, SOCIOECONOMIC DATA SUMMARY (2017), https://coast.noaa.gov/ digitalcoast/training/socioeconomic-data-summary.html.

See NOAA OFFICE FOR COASTAL MGMT, Fast Facts: Economics and Demographics, https://coast.noaa.gov/states/fast-facts/economics-and-demographics.html (last visited Apr. 4, 2018).

^{3.} In this Comment, the term "coastal" refers to both ocean- and embaymentfronting areas of the coastal environment.

NOAA, What Percentage of the American Population Lives Near the Coast?, NAT'L OCEAN SERV., https://oceanservice.noaa.gov/facts/population.html (last visited Apr. 4, 2018).

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and application in reducing risk to land-based assets, people, resources and society, to say nothing of offshore industrial development such as oil and gas or mineral extraction that may evolve into the future.

While FAMs can serve as a catalyst prompting industrial businesses and developments to take steps or make modifications that reduce risk and enable them to secure lower insurance premiums, the points in time during which such actions are most cost-effective and feasible are at the siting, planning, design, or post-event re-building stages of development. Risk-reducing infrastructure modifications and facility siting become more problematic and costly once construction is complete. To achieve the greatest riskreduction potential from FAMs, consideration should be given to how the application of this approach could be tailored and implemented in ways that reflect the different climate change vulnerabilities facing either new or existing coastal industrial development. To build support for FAMs to reduce industrial risk in an era of climate change, open dialogue amongst all parties would enable FAMs to be designed, reviewed, and established in ways that reflect these differences.5

III. Networks of Coastal Industrial Supply

Mr. Arnold describes how some coastal industries count on easy access to port facilities, fuel terminals, and other coastal-oriented infrastructure in addition to upstream producers. That same coastal orientation that benefits companies exposes their facilities to climate-driven impacts from both episodic storm events and longer-term risks such as inundation from sea level rise. In either scenario, the risk of an industrial accident that exposes the surrounding environment and population is increased due to the facility's location. The author notes that during recent storm events, including Hurricanes Katrina and Rita, the scope of disaster impacts was not limited to areas directly surrounding the industrial oil and gas refinery facilities. The author presents arguments for how FAMs could cover the financial impacts of an industrial disaster that occurred due to climate change, but does not address whether or if FAMs could or should cover impacts that are not proximate to the industrial facility. A challenge that may exist in establishing the will to require FAMs could include the degree to which a FAM covers impacts further up or down the supply chain or network of the industrial facility. Establishing the scope and scale for which a FAM should cover impacts would provide more realistic cost estimates for FAM tools—such as insurance premiums that would be required of coastal industrial facilities. This information would allow federal, state, or local governments to realistically evaluate the costs and benefits to a jurisdiction when considering the use of FAMs to reduce coastal industrial risk.

IV. Risk Shifting and "Opportunities Lost"

The author notes that at first, FAMs will likely not be enough to cause industries to relocate, but that if the added costs do result in business relocation, the benefit may outweigh the cost. He states that coastal industry FAMs would not directly affect most coastal residents, thus provoking less political resistance than other adaptation measures. One does not have to look too far for examples of communities that have experienced industrial disasters along the coast where, in addition to the immediate and long-term economic and social costs, there were significant environmental and human health impacts. In considering FAMs as a means to address climate-driven coastal industrial disaster costs and risks, the issue of economic and social costs cannot be understated nor can the "opportunities lost" factor be ignored as a tangible direct impact to coastal residents.

In considering two otherwise-equal locations for industrial development or re-investment,⁶ a FAM requirement in one location may tip the scale in favor of the other, thereby shifting or doubling down on risk toward or in a particular area. The author states that FAMs initially may emerge piecemeal, and until such mandates achieve a demonstrated benefit, this may very well be the case. However, by building partnerships, communicating, and sharing information amongst businesses, communities, insurers and governments, significant potential exists to accelerate the use of FAMs by creating conditions that would lessen direct and indirect disaster costs or reduce the potential for community economic or opportunity loss.

Command-and-control approaches—like planning and zoning tools-could complement FAMs to enable coastal industrial uses in community areas where they may pose less risk. This co-benefit approach may also result in reduced cost to the industrial business, and may incentivize or create conditions for economic and job investment in the community, should they pursue FAMs as a means to achieve risk reduction. The author states that insurers are specialists in risk management and that they draw on proprietary knowledge as they assess and value risk. Arguably, to achieve measurable and meaningful climate change risk reduction within a necessary timeframe,⁷ information must be more integrated and readily shared to ensure that the overall and long-term costs and risks are minimized. Consistency in FAM approach or policy could be beneficial, and the author states that FAMs could be workable and effective through a review of existing policies at all levels of government.

^{5.} Involved or affected parties could include governments, insurers, industry businesses and communities.

Re-investment in this sense could refer to upgrades to or expansion of an existing industrial site, or additional business investments in the surrounding community.

^{7.} Action must be taken now to mitigate future climate change risk.

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V. Facility Lifespans and Identifying FAM Areas

The question of the timeframe and likelihood of various impacts on a facility or project over its anticipated lifespan is central to climate change-related discussions, adaptation and mitigation actions, and policy development. Scientists, regulators, insurers, and businesses will continue to track and analyze climate science and work to ensure that the best available science is used to reduce or mitigate future cost and risk. In the pursuit of FAMs as a tool to address coastal industrial cost and risk challenges, it would benefit the conversation to consider how to narrow the timeframes over which FAM conditions are reviewed. This periodic review approach may clarify how to evaluate risk in a way that is responsive to evolving climate science in various geographic locations, and perhaps also how to garner support at a broader scale to address any question regarding the cause or driver of a particular disaster. The author notes that the Federal Emergency Management Agency floodplain maps could be used to identify geographic locations appropriate for FAMs. While they may assist in informing the initial scope of where FAMs could be applied, these maps outline only areas where current risk exists. Limiting the application of FAMs to just areas identified on these maps may significantly underestimate the geographic scope of risk as sea level rise and future climate effects are not incorporated into these products.8

VI. Determining the Scope of Risk and Liability

In the context of establishing FAMs, the question of how cost, liability, or responsibility would be assigned would also need clarification. Mr. Arnold acknowledges that some liability can be evaded when environmental disasters occur because they "entail tricky questions of causation and valuation." When a storm hits and results in a coastal industrial disaster, at what point would FAMs that address climatedriven impacts be applicable, versus other insurance coverage requirements? Following an industrial disaster, where does the burden of proof lie in establishing whether climate change played a role in the associated direct and indirect impacts? Where a coastal industrial facility already carries standard insurance, would adding a climate-related impact Discussion on this very issue is evolving on a regular basis.⁹

VII. Conclusion

Mr. Arnold's argument for the role that FAMs may play in addressing underinvestment in coastal industrial disaster risk is valuable. In assessing how to mitigate the risks and adapt to the impacts of climate change, he makes a strong case for FAMs as a tool to address climate-driven or -exacerbated coastal industrial disaster management challenges.

^{8.} While the current Federal Emergency Management Agency (FEMA) flood-plain maps do not account for future conditions, in accordance with the Biggert-Water Flood Insurance Reform Act of 2012, FEMA "is to establish a Technical Mapping Advisory Council that will provide recommendations to FEMA on flood hazard mapping guidelines—including recommendations for . . . the impacts of sea level rise. . . . " FEMA, *Coastal Frequently Asked Questions*, DEPARTMENT OF HOMELAND SECURITY, www.fema.gov/coastal-frequently-asked-questions (last visited Apr. 5, 2018).

D. See Letter from David H. Krantz, Director, Ctr. for Research on Envtl. Decisions, Climate Change: Uncertainty and the Burden of Proof, CTR FOR RESEARCH ON ENVTL. DECISIONS, http://cred.columbia.edu/about-cred/ letter-from-the-director/ (last visited Apr. 4, 2018); Noah S. Diffenbaugh, How We Know It Was Climate Change, N.Y. TIMES (Dec. 29, 2017), https:// www.nytimes.com/2017/12/29/opinion/sunday/climate-change-globalwarming.html.