

External Factors – Debris and Donations

Supply chains are fundamentally concerned with the movement of goods. Each individual supply chain is subject to constraints that limit its overall capacity to move goods that manifest on the nodes and links that make up the supply chain network. Prior case studies have shown how disruptions of key inputs to individual nodes and links, sudden surges in flow, lost signals, different needs during emergencies versus normal operations, and other stumbling blocks can interrupt normal supply chain functioning. It is often difficult to disentangle the specific supply chain effects from the overall context of disaster management, and isolate interdependent supply chains for the purpose of analysis. Instead of focusing on individual supply chain effects, this final case study focuses on the on-the-ground realities of the disaster zone, and the external factors that can have effects on movement of goods in the hardest hit areas.

We focus on the issues of debris management and donations from private sector, charitable, and other non-governmental organizations. Debris management is a pressing issue for islands. Hurricanes Irma and Maria, as Category 4 and 5 hurricanes, respectively, were very destructive and left enormous amounts of debris in the U.S. Virgin Islands. The vast amounts of downed trees and other debris initially slowed response efforts as crews worked to clear roads. The headaches caused by debris do not go away easily for islands that typically have limited capacity in landfills.

Hurricane Harvey, which hit the Gulf Coast as a Category 4 hurricane and then inundated the city of Houston with more than 60 inches of rain, brought other challenges—including donations. A hallmark of the response to Hurricane Harvey was the amount of community support and action in the aftermath of the hurricane. Unfortunately, the good intentions of concerned people sending donations can have unintended negative consequences on private sector supply chains and make it harder for relief workers.



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DEBRIS MANAGEMENT ISSUES IN USVI FOLLOWING IRMA AND MARIA

Just before 6:00 a.m. EST on August 30, 2017, the roosters roaming the streets of the US Virgin Islands (USVI) crowed their daily wake-up call as the sun peeked above the horizon. Islanders awoke on this Wednesday to a typically hot, sunny, and beautiful summer morning. Few were overly concerned by news that a tropical storm named Irma was forming over 2,300 miles to the east. Within 24 hours, Tropical Storm Irma had strengthened to become Hurricane Irma, a Category 3 storm. Eyebrows began to raise. On September 4, Irma, which continued to move eastward toward the Leeward Islands, strengthened into a Category 4 hurricane about 500 miles from USVI. Now everyone on the Islands was paying attention.

Hurricane Irma strengthened further into a “potentially catastrophic” Category 5 storm and made landfall in USVI on Wednesday, September 6. The storm devastated St. John and St. Thomas, (See Figure CS6-1) two of the archipelago’s three primary islands (the other being St. Croix), as well as the sparsely populated Water Island. This Wednesday had been anything but typical.

Although Irma largely spared St. Croix from her wrath, the hurricane nonetheless did considerable damage to the island’s west end. Many Cruzans (St. Croix residents) donated their hurricane supplies to survivors in St. John, St. Thomas, and the British Virgin Islands. [1] Less than two weeks later, many who had donated supplies were in desperate need of them.

Enter Tropical Storm Maria, which formed on September 16 about 620 miles east-southeast of the lesser Antilles [2] before rapidly intensifying into a Category 5 hurricane by the following day, when the National Weather Service (NWS) warned that now-Hurricane Maria would likely be highly dangerous to the beleaguered islands of Puerto Rico and USVI. NWS’s dire warning statement forecasted “catastrophic damage” from wind, causing “structural damage to sturdy buildings, some with complete roof and wall failures,” and warning that “locations may be uninhabitable for weeks or months.” [3]

Figure CS6-1. Aerial photos of a neighborhood in St. John before (left) and after (right) Hurricanes Irma and Maria illustrate the volume of debris.



Source: CNA (see images for specific image credits)

The Federal Coordinating Officer (FCO) and Incident Management Assistant Team (IMAT) hunkered down with USVI Governor Kenneth Mapp on St. Croix, awaiting the storm's potential landfall. [4] Two days later, on September 19, Maria oscillated between Category 4 and 5 strength as it descended on USVI. This time, all three primary islands were hit hard; St. Croix was battered with 175-mile-per-hour winds. [5]

All told, Irma and Maria destroyed or damaged approximately 18,500 homes and businesses in USVI. [6] Debris clogged the Islands' ports and poorly maintained roadways. In late September, debris experts performed aerial assessments of St. John to reassess damage and verify estimated debris quantities. For St. John, St. Thomas, and St. Croix, the total debris estimated for removal was 1.3 million cubic yards, the equivalent of 400 Olympic-size swimming pools [7] (the actual amount turned out to be 1.1 million cubic yards [8]). Long after the dust and debris had settled, the question of how the Islands would dispose of an islands' worth of debris was anything but.

Early in the New Year, Kenneal Smith, an employee at Bovoni Landfill, the largest on St. Thomas, stood surrounded by tons of debris dropped off at the landfill. He looked up at the four-story-tall debris piles lining Bovoni's entrance. "You used to actually be able to see over these banks," Smith said. "And the trucks [carrying more debris] just keep coming." [9]

In March 2018, Stacey Plaskett, USVI’s delegate to the US House of Representatives, voiced her and many islanders’ continued frustration with the lack of progress on debris disposal, declaring that “The debris build up on the US Virgin Islands left by Hurricanes Irma and Maria has reached devastating heights.” [10] That same month, the US Army Corps of Engineers (USACE) announced it would complete collection of vegetative and construction and demolition (C&D) debris from roadside rights-of-way in St. John and St. Thomas on Friday, March 15, and completed pickup on St. Croix on March 7. [10]

Today, months into the 2018 hurricane season, Islanders continue to recover from the previous season, one of the worst in USVI’s history. [11] And debris disposal efforts are finally—and still—underway.

Natural Disasters and Waste Management

The types of debris created by hurricanes can include soils and sediments, vegetation, municipal solid waste, C&D debris, vehicles, food waste, white goods (i.e., large electrical goods used domestically, such as refrigerators and air conditioners), and household hazardous waste. [12] According to USACE, 80 percent of debris in USVI was vegetative; [9] the remainder was primarily composed of C&D debris, vehicles, vessels littering ports, and old medical waste. [13]

The timely and safe disposal of debris can be challenging, especially in an area dealing with other disaster-related complications, but is integral to response and recovery. [8] Clearing debris from roads and ports enables faster restoration of critical supply chains for power, fuel, water, and retail goods, including food. Debris clearance was generally conducted in a timely manner across USVI, but once cleared, the territory had no ready means of debris disposal: USVI has no viable landfills, residents and environmental successfully rallied against plans to incinerate debris, and exporting debris is a timely and complex process. Debris disposal was delayed by many months for reasons discussed below.

FEMA, the US Environmental Protection Agency (EPA), and USACE have been supporting post-Irma and -Maria debris management on USVI. EPA is responsible for disposal of household hazardous waste and white goods (because they contain coolant and other chemicals); USACE is responsible for vegetation and C&D debris. EPA and USACE both provide technical assistance on municipal solid waste.

Preexisting Waste Management Problems on the Islands

In the past, USVI’s Department of Public Works (DPW) was responsible for waste disposal in the Islands, but after consistent safety and non-compliance problems, the Virgin Islands Waste Management Authority (VIWMA) was formed in 2004 to better handle solid waste and

wastewater disposal in USVI. [14] The two landfills in USVI, Bovoni on St. Thomas and Anguilla on St. Croix, are near capacity and scheduled for closure under an EPA consent decree. St. John's landfill was closed in the 1990s due to safety concerns and now serves as a transfer station to the St. Thomas landfill. [14-17] EPA is working with USVI to establish new landfills, but there are currently no viable landfill options and no ability to create an EPA-approved emergency landfill. In addition to the lack of viable landfill space, waste disposal equipment in USVI was poorly maintained. According to a USACE representative, the Rotoclave rotating autoclave on St. Croix had not been serviced in 15 years. [13]

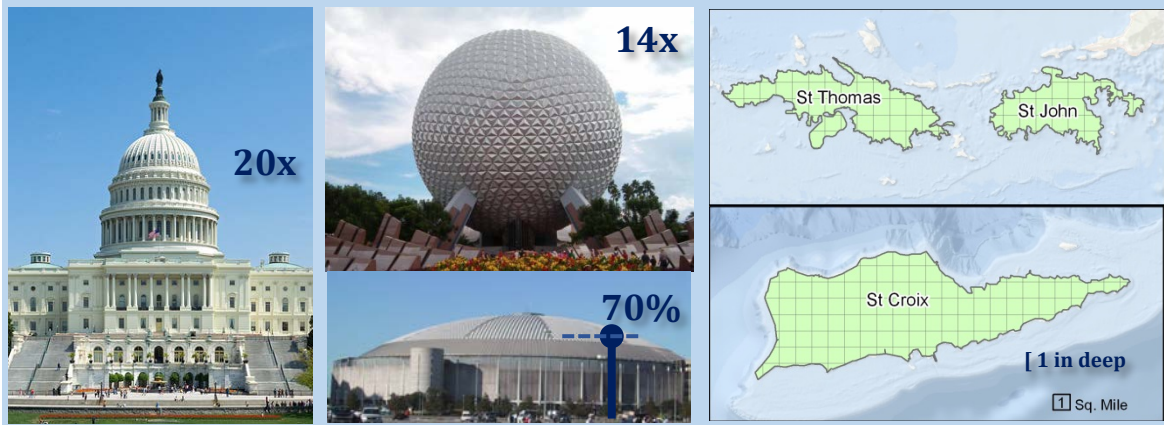
Additionally, FEMA has encouraged state, local, and territorial governments, via its *2007 Disaster Assistance Strategy: Debris Removal Operations*, to conduct pre-event debris management preparation and planning, such as pre-qualifying debris removal contractors to ensure immediate post-incident availability of coordinated debris removal support. [18] However, the USVI government took little, if any, significant action on pre-event debris management preparation and planning. [13] USVI's government had not established any pre-incident agreements or contracts for off-island debris disposal.

High Volume of Debris

Hurricanes Irma and Maria produced 1.1 million cubic yards of debris in USVI. [8] This means the entire 134 square mile area of the USVI would be covered an inch deep in debris on average. As shown in Figure CS5-2, this volume would fill the US Capitol Rotunda 20 times over, the Spaceship Earth at EPCOT Center 14 times, or 70 percent of the Houston Astrodome. [19] According to USACE, which is working with the USVI government for clearing, management, and disposal of debris, [8] 80 percent of this debris was vegetative. [9] USACE was initially responsible for debris management on St. John and St. Thomas, because the USVI government was hoping its DPW could handle debris on St. Croix. However, USACE eventually had to manage debris on all three islands [13] because the USVI government lacked the resources (both funding and personnel) to do so.

USACE and EPA supported disposal of medical waste in USVI. [13] USACE found years-old medical waste in damaged shipping containers during a hospital inspection, and provided logistical support for disposal of the waste off-island. [20] Early in the response, a large number of vessels (i.e., boats) had to be removed. Once the hurricanes passed, the US Coast Guard (USCG) immediately began performing vessel removal using two tug boats, eventually removing about 300 vessels. [13]

Figure CS6-2. The 1.1 M cubic yards of debris on the USVI after Irma and Maria would have filled the Capitol Rotunda 20 times, EPCOT Center 14 times, the Houston AstroDome 0.7 times, and, on average, covered the entire USVI an inch deep.



Source: CNA, Wikimedia Commons

Limited Ability to Dispose of Debris On-Island

USVI lacks viable landfills and emergency landfills for on-island disposal, which complicated hurricane-related debris disposal. A joint Debris Task Force of territorial and federal agencies, including the Virgin Islands Territorial Emergency Management Agency (VITEMA), DPW, WIWMA, Department of Planning and Natural Resources, the US Department of Agriculture (USDA), FEMA, USACE, and EPA was formed to develop vegetative debris disposal strategies. The task force reviewed three methods of reducing vegetative debris across the territory—composting, chipping, and air curtain incineration (ACI)—and the USVI government chose the ACI method to dispose of the 750,000 cubic yards of vegetative debris from across USVI.[21-22] Governor Mapp argued that ACI was the cheapest and most efficient means of disposing of vegetative debris. [9]

Environmental groups and health experts came out in strong opposition to the plan, due to concerns that it would exacerbate health effects in USVI, where air quality was already poor due to prolonged generator use, as did the general public. "Using air curtain incinerators presents an imminent and substantial endangerment to health and the environment," the Sierra Club, Virgin Island Conservation Society, and Island Green Living Association wrote in a joint letter to FEMA and USACE. [23]

There was reasonable cause for concern: when the EPA tested air quality over a six-week period while ACI was being used in New York City after Hurricane Sandy, the agency detected unhealthy air quality after just four days. [9] These environmental health concerns were heightened by preexisting air quality issues on St. Croix and the fact that for much of its history, USVI has endured repeated environmental hazards, including underground landfill fires and pollution from the oil and rum industries. [9]

In response to public pressure, the USVI Senate passed legislation banning the proposed incineration of vegetation. Governor Mapp, worried the federal government would walk away from the cleanup effort if USVI defied USACE, vetoed the legislation. In late December, USVI's Senate voted to override Mapp's veto. [9]

Instead of using incineration, mulching and composting vegetative debris was proposed. Proponents of this means of disposal argued it could be used to address hurricane soil erosion and enrich soil for farmers. The federal government was hesitant to proceed with mulching and composting because of concerns that USVI lacks enough space for mulching and composting and sufficient funding to support this costlier disposal method. [9, 23]

Mulching also entails safety risks. USVI Governor Mapp expressed concern that piles of mulch could become fire hazards. [9, 23] Also, if mulch and chipped vegetative debris pile up and go unused, they can rot, posing other health risks. This is of particular concern in USVI, where there is already an excess of accumulated mulch. [23-24] Parks, golf courses, universities, businesses, and other public and private entities expressed their support for the plan and pledged to accept new compost if the plan goes through. [23] However, beyond environmental and health concerns, there are also associated cost concerns. USACE estimates determined that incineration would cost about \$5.2 million, mulching would cost \$5.3 million, and composting would cost \$7.1 million. [23]

With no prospect of off-island disposal in sight, the debris continued to pile up. Piles of debris, like piles of mulch, can create fire hazards and attract disease-spreading insects and rodents if not quickly disposed. [9, 21] Governor Mapp was especially concerned about the risk of fire, given the Islands' limited firefighting resources. "I don't have the firefighter capacity to handle it if it ignites," he said. [9] (Note the irony here: the inability to incinerate the debris resulted in the accumulation of numerous, massive debris piles, which are fire hazards.) Officials assured the public that hurricane debris at USVI's two debris staging areas, the Cancryn site on St. Thomas and the Body Slob site on St. Croix, is being responsibly managed and monitored to reduce risks to the environment and to public health. [8]

Problems with Exporting Debris

Much of the debris created by Hurricanes Irma and Maria is being exported, although a number of requirements for exporting debris created confusion and delays around debris disposal. When debris is exported from USVI, it must meet both USVI requirements and the destination's requirements. There should be agreements and permits in place prior to disposal—neither of which were established by the USVI government pre-incident. [13]

USACE intends to ship metal and C&D debris to CONUS for sale and disposal, but a lack of prior agreements and various regulations have delayed and complicated that effort. [9] For example, there were problems disposing of the approximately 300 vessels that USCG removed from USVI ports. Marine debris cleanup does not usually occur until later in the response, but USCG was already in St. Thomas, so it started moving vessels and pushing them to USACE. USACE had a task order in place to remove all marine debris before March 14, 2018, and was supposed to take all marine debris to Moss Point, Mississippi (the debris cannot be barged until a permit is acquired [13]). It later learned that Moss Point would not accept any debris from USVI. It tried to work with Alabama, but the state would not agree to accept the debris. As of June 2018, USACE was attempting to obtain a permit with the Dominican Republic.

Vegetative debris, which could contain seeds, sprouts, and insects, is problematic to export because of invasive species concerns. [9] These concerns, coupled with a lack of pre-incident planning by the USVI government for off-island disposal of vegetative debris, significantly delayed the export of vegetative debris. In May 2018, USACE awarded contract for off-island disposal of vegetative debris [9], with barging expected to begin in August 2018. [25] In July 2018, FCO Vogel stated that “FEMA has worked with the Virgin Islands government to assure management of this debris is in compliance with all necessary federal and territorial laws and regulations. We’ve come a long way, and we’re looking forward to the completion of hurricane debris disposal during the next few months.” All eligible debris has been collected and significant progress is being made toward the goal of shipping it off of USVI. [25]

Debris Management Constraints and Considerations

Debris management in USVI was hampered by infrastructure capacity limits, insufficient funds, and political constraints. Specifically, the following issues affected post-disaster debris management in USVI:

- ***Preexisting waste management problems:*** USVI only has two landfills, and they are in the process of being closed under an EPA consent decree.

- **High volume of debris and limited ability to dispose of debris on-island:** Hurricane Irma and Hurricane Maria produced over a million cubic yards of debris in USVI, [8] which far exceeded the receiving capacity of its few landfills. USVI's lack of landfills (and even emergency landfills) necessitated other means of disposal.
- **Regulatory and financial issues hinder disposal:** The USVI government prohibited waste disposal via incineration because of public health and air quality concerns. Other disposal methods, such as mulching and composting, are time-consuming and require more funds and personnel than the USVI government could provide. Exportation of debris was an option, but proved difficult. Requirements for exporting debris (e.g., finding a receiving facility, waste handling regulations) created confusion and delays in debris removal and disposal.

Debris management—or, more generally, waste management—is a key function of disaster recovery and response. Not a supply chain in the typical sense, the handling, processing, and disposal of waste is nonetheless subject to many of the same types of constraints and challenges. Although the “goods” in question are waste product, and the demand signal is geared toward removal instead of acquisition, the number and capacity of key facilities, limitations on key resources (e.g., personnel, equipment, fuel) can function as bottlenecks for the movement of debris. The USVI illustrated how structural deficiencies (few landfills), physical capacity limits (landfill capacity shortfall), and regulatory restrictions created challenges for waste management.

There were mercifully few spillover effects into to other supply chains related to debris management in this case, but this conclusion may not be generalizable. Cleaning up storm debris is a key priority for both response and recovery. Immediately after a storm passes, clearing debris is crucial for opening transportation links (e.g., roads, shipping channels, rails) necessary for other supply chains to function. The stories after Maria in the USVI were largely that the initial clearing of roads was sufficient to allow effective transportation. It is unclear whether delays in debris removal may have meaningfully delayed the process of recovery and rebuilding. The initial evidence does not flag this as a major issue, but it may warrant further investigation.

Debris management can also put stress on other common pool resources, particularly personnel and fuel. Managing debris clearing requires manpower and vehicles and equipment (which require fuel). Emergency management personnel have to be diverted from other tasks. In the case of the USVI, it appears the heavy debris clearing workload of did not create critical shortages of these resources. The roads got cleared enough to allow transportation of supplies. There were some personnel effects, as people needed to manage the debris removal and perform fire watch at the large debris piles—a need “created” by the bottlenecks preventing disposal of these piles. Fuel resupply was initially a concern for the

USVI, but it was restocked in time to allow debris clearing to continue, and not create critical shortages.

The key issues for debris management were at the end of its supply chain: sorting, processing, and, especially, disposal. Figuring out how to process and dispose of debris was a substantial challenge, even if it did not cause major spillover effects. The USVI's experience may be typical of other islands, where facilities to process and manage waste are limited to begin with and the huge load of debris causes significant challenges for disposal. The lack of a plan and contracts to collect and dispose debris likely contributed to the difficulties the USVI experienced. For future hurricanes, strategic planning to identify additional debris storage, get regulatory approval for disposal options (e.g., mulching, incineration), and secure contracts for waste export from the islands appear to be priorities that would alleviate future debris management challenges.

DONATIONS: TEXANS HELPING TEXANS GOES A LITTLE TOO FAR

After Hurricane Harvey hit the Coastal Bend communities of Port Aransas, Aransas Pass, Rockport, and others nearby, local emergency managers were overwhelmed by the magnitude of the damage to their communities. Virtually all utilities were down and the communities were virtually cut off from any communication with the outside world. Very few buildings had intact roofs, including many of the buildings designated as local emergency operations centers, such as the Aransas Pass Civic Center (see Figure CS5-3). As the storm started moving away, the first responders who rode out the storm dealt with the typical high-priority tasks of setting up the command center and incident management teams, checking on health and safety of residents who rode out the storm, and dispatching teams to manage curfews, roadway opening, and fire watch.

After coming ashore, Harvey moved inland with winds still at tropical storm force. The high winds prevented FEMA from sending trucks to the affected areas,¹ but FEMA also had not received many requests [26], in part because the affected communities had no way to communicate those requests. FEMA meals and water did eventually arrive to the various affected communities, but not until September 1, 2017, nearly five days after the storm passed. What did these communities do in the meantime?

They certainly did not go hungry. In fact, many participants of the 2018 Coastal Bend Hurricane conference complained about the "Harvey 20," a reference to the number of

¹ Typically, FEMA does not send out trucks when sustained winds exceed 35 miles per hour.

pounds they gained during the hurricane response. One emergency manager joked that on any given day, most of the towns were only a few cases of beer short of the best summer barbecue party you'd ever attended, referring to the multitude of organizations setting up free hot food distribution in the disaster area. [27] While FEMA and state agencies primarily respond to aid requests, nongovernmental organizations, community groups, local businesses, churches, and private citizens have no such restrictions. After the storm passed over, these groups immediately started organizing donations to send to the affected communities. Within 24 hours, the "stuff" started arriving in the hard hit areas of the Coastal Bend.

The Problem with "Stuff"

On August 26, 2017, less than 24 hours after landfall, local emergency managers in the Coastal Bend communities were working to re-establish basic continuity of government and situational management. With debris everywhere, roads partially blocked, and the whole area under a fog from storm spray and intolerable humidity, fully-loaded tractor trailer trucks emerged from the mist and stopped in the middle of town. Less than one day after the hurricane hit, trucks full of supplies were arriving. [28] A mixture of relief, surprise, and some concern washed over the emergency managers and first responders. [27] They would not go hungry and the supplies were useful, especially considering that communications were down and they could not be requested. The pull signal in the supply chain was lost, but the push arrived, unbidden. "Wouldn't it be great if we could require anyone dropping donations to have a full inventory and sort it once they got there? We just had trucks dropping their load and leaving," commented a volunteer during the 2018 Coastal Bend Hurricane Conference. [28]

Unfortunately, the first trucks unloading that day were not a stopgap to help a community survive its first 48 hours post-disaster. They were the start of a flood of goods, another element of the disaster to be managed.

The first issue with the "stuff" (e.g., water, food, blankets, clothes) was that there was no place to store it. "We desperately needed a plan to deal with 'stuff' arriving. So many tractor-trailer loads of stuff just started pulling up from local donations, churches, etc. One of the biggest challenges was where to put things, especially the donations that just kept arriving," said Stan Upton, Emergency Management Coordinator for Refugio County. [27]

Power was out, so there was no climate-controlled space. Harvey had torn the roofs off of so many buildings that there was little dry space to put anything, and the dry space that was available was needed to set up basic emergency operations. The Aransas Pass Civic Center was designated to be the focal point of the town's emergency operations, but it had over a

foot of water in it from the rain. [27] That left parking lots as the only place to put the arriving goods. But many of them were still full of storm debris. (See Figure CS6-3.) Almost as soon as the lots were being emptied of debris, they were being filled with “stuff.”

Figure CS6-3. The Aransas Pass Civic Center (left), and debris in parking lots in Port Aransas.



Credit: CNA



Credit: Jim DeVisser, CCFD

Source: CNA, CCFD

The organizations (churches, social clubs, companies, charities) sending the supplies were often taking a shot in the dark, at least according to the local emergency managers. [29] A session on donations management at the 2018 Coastal Bend Hurricane Conference recounted truck drivers being sent out without firm destinations, but simply “showing up” and dropping their loads when they felt they had gotten far enough into the disaster zone. Further, there was an almost-palpable resentment that the trucks were using fuel, clogging roads, and leaving “stuff” in any open space in town. [28] And worse, they were arriving before re-entry was authorized, actually creating burdens for communities trying to recover.

DeAnna Stemock, State Voluntary Agency Liaison for the Texas Department of Public Safety explained, “It can create fiscal issues because the donations need to be tracked and valued. The county officials and judges are busy and don’t want to be fiscal agents for managing these donations. We also heard some reports of companies later invoicing for what appeared to be donations.” [28]

As the stuff started piling up, additional problems emerged. A truckload of goods left in a vacant parking lot creates a cascade of demands on affected communities. There is a labor burden created because someone has to sort the goods, which often arrive without an

inventory. This labor creates additional burdens in two ways. Either local government staff are taken away from other activities, or volunteers arrive and need resources (food, shelter, sanitation) to support themselves. Ms. Stemock, stressed, “Ultimately, you have to be very specific about what you need and want. How much of it is needed, and where is it needed? Communities also should have Volunteer Relief Coordinators to take the burden off the emergency managers. Their function should be to manage the ‘stuff’ and more importantly, the volunteers and people coming in to help. You want to know who is coming into your community. Most people are good, but some aren’t, and you need to know who they are. Also, need to tell them what they need to be ready with to stay in the community (food, shelter, etc.) You need to build an asset-based recovery, where the gifts and assets are the focus, and targeted to what is really needed.” [28]

By the time four or five days had passed, the sheer quantity of stuff was creating problems of its own. There was more water and food than could reasonably be used. Captain Lynn Pearce, Aransas Pass Emergency Management Coordinator, said “We could have started filling swimming pools with bottled water if we had wanted to.” The piles of clothes, toys, and other goods created their own problems. Left out in the elements, they soaked up water, grew mold, and were a breeding ground for mosquitoes. [27] The stuff brought into town had created a waste-management issue. In the weeks and months after the disaster, Ms. Stemock helped coordinate volunteers that actually removed donations from disaster affected areas. In total, the State facilitated removal of over 531 pallets of unsorted donated goods (which did not include clothes). [28]

Even though communities in the Coastal Bend were flooded with goods, there were still some unmet needs. Several veteran disaster volunteers note that tarps and waterproof containers always seem to be in short supply. [28] Port Aransas put out requests for toilet paper, shovels, and other goods. But they did not turn off the requests soon enough—they ended up with far too many shovels. Mold became a persistent issue in the hot and humid conditions, and masks became required personal protective equipment for any first responder or volunteer entering damaged buildings. Tim McIntosh, a Port Aransas Emergency Medical Technician, noted “We acquired every N95 surgical mask we could get our hands on.” [29]

Supply Chain Effects

Donations reflect the desire of people to provide help during a disaster. When supply chains break down, donor groups do their best to anticipate how to fill needs, regardless of their level of understanding of the actual needs. But some relief workers call the disruptive onslaught of unneeded goods after the initial emergency “the second disaster.” [30]

In the Coastal Bend communities affected by Harvey, the pull signal in the supply chain was cut off because communication lines were completely cut. Without a clear pull signal, the donations are pushed into the area with the hope of finding an area where they are needed. Even as communications returned, affected communities had to quickly learn to be very specific about communicating needs (especially over social media). It was not enough to specify a need for say, shovels; specifying a precise number of shovels delivered to a specific location became necessary to avoid having shovels delivered in many multiples of the number needed. FEMA and private relief organizations have tried to encourage donors to “donate responsibly” [31]—explaining that cash donations are the most helpful.



Figure CS6-4: Traffic at the re-entry checkpoint at Port Aransas stretched more than 10 miles

Credit: KRISTV (Corpus Christi)

Donations often complicate the response and restoration of other supply chains. Donations make it harder for relief workers by sending the wrong things that clog ports, airfields, and relief stations, which can prevent needed goods from being delivered and distributed. In the early days after the Harvey, trucks, drivers, and fuel were perceived to be in limited supply. [26] First responders expressed real concern about getting sufficient fuel for their vehicles if trucks were filling at the closest stations. [27] The additional traffic also created issues at first, when communities were still trying to clear roadways. Later on, the arrival of donations complicated re-entry of citizens. Port Aransas had only one point of entry into town and established a checkpoint for returning citizens. [29] Because of the need to check identification and give returning citizens a significant amount of information, the waits at the checkpoints reached hours long (see Figure CS6-4). [32] Donations vehicles without a clear direction to deliver their goods to the town were turned back, which only lengthened lines for returning residents and shipments of requested aid goods.

Preliminary Analysis

Donations management has become a standard feature of disaster recovery, but the issues are recurrent despite improved messaging to relief organization and the general public. The quantity and especially the timing of donations can have a real effect on supply chains and more importantly, the ability of first responders to do their jobs in the immediate aftermath of a storm. Donations arriving in the immediate aftermath a storm can create additional

hazards for first responders, residents, and the volunteers delivering them. The quantities of supplies donated can have chaotic implications for the supply chains they both replace and compete with for key resources. Unquestionably, donated food and water is more cost effective than food and water provided through a relief channel, and often quicker. It can alleviate burdens on other supply chains. The key downside is the resource demands that donations management imposes on communities. Managing donations requires storage space, organizational capacity, and manpower, and can impose additional burdens in the form of housing needs, food, sanitation, and fuel for the organizations operating in (or near) the disaster zone. Early in the response phase, these induced demands can sap the community of resources needed to conduct basic incident management and life-saving activities, and to repair critical supply chains.

This case study was developed by the Institute for Public Research at CNA, a not-for-profit research organization that serves the public interest by providing in-depth analysis and result-oriented solutions to help government leaders choose the best course of action in setting policy and managing operations.

Additional case studies related to issues of Supply Chain Resilience emerging from the 2017 Hurricane Season are available at: www.cna.org/supplychainresilience

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