

## County Removes 573,866 Cubic Yards of Debris in 99 Days

This solid waste division's removal plan serves as model for natural disaster response.

By [Carrie Aurit](#), [Laura Dorn](#)

### Dumping the Debris



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#### Manatee County Solid Waste Division

**Service area:** 743 square miles

**Communities:** Cities of Anna Maria, Bradenton, Bradenton Beach, Holmes Beach, and Palmetto and Town of Longboat Key

**Population:** 363,000

**No. accounts:** 86,000

**Landfills:** 1

**No. employees:** 40

No matter how well you plan, you'll have to tweak disaster response on the fly. A tornado destroys and distributes things differently than a hurricane, for example, and where everything lands and how it piles up depends on geography.

Public works can make educated guesses about what's going to happen, but must hammer out removal details with multiple jurisdictions and multiple contractors once the storm ends. These interactions generate mountains of paperwork that must be submitted to the Federal Emergency Management Agency (FEMA) within six months. It's a tedious, detail-oriented task conducted under great stress, making it rife for errors federal agencies use to decline reimbursement applications. Thus, not preparing for the administrative aspects of a disaster can have painful bottom-line consequences.

Manatee County, Fla., wrote its first debris management plan in 2011. Whether by luck or by design, the Solid Waste Division tweaked the document six months before Hurricane Irma hit nine states in September 2017. The storm's 185 mph winds killed more than 130 people and caused \$65 billion in damage, making it the fifth-costliest hurricane on record. The eye didn't pass directly over the county, which faces the Gulf of Mexico, but the storm did substantial damage to homes, businesses, and public property.

Even though the power went out and competition for equipment and labor in Florida and throughout the southeast was fierce, debris was removed in four months with no injuries. The county's 20 schools, which housed 20,000 evacuees, reopened eight days after the storm hit. All FEMA forms were submitted on time.

### Clarifying Multijurisdictional Roles

One reason for the successful recovery is that valuable time wasn't wasted figuring out who'd handle what. The county had retained environmental consulting firm SCS Engineers to execute its debris management plan based on the National Incident Management Systems (NIMS), a standardized approach developed by the U.S. Department of Homeland Security that facilitates federal, state, and local government cooperation during emergencies. By addressing key procedural issues, the 43-page document minimizes the potential for misunderstandings and miscommunications that could hamper future interjurisdictional relations.

For example, the county's six cities must remove their debris but may bring it to the county's temporary disposal sites in their own trucks or those of their contractors. In addition to explaining the county or its representative must first certify trucks and that only clean vegetative debris (not mixed debris or construction and demolition debris [CD&D]) is accepted, the document outlines how the county's costs from that point on are calculated and charged back to cities:

**Site management and debris reduction.** Billed at contract pay rate when county is invoiced. Haul-out costs and tipping fees for final disposal billed at conclusion of operations, when final ratio volumes can be calculated and applied to final disposal costs.

- **Monitoring.** Billed based on labor time disposal sites. Load calls are made by county's monitor and cities must resolve any disputes with their hauling contractor. Tower monitors call loads for cities the same way they do those of county contractors.
- **Data management.** SCS provides digital carbon copy tickets at each disposal site. County keeps one copy to track inbound volume, one's for contractor operating the site, one goes to city's debris liaison, and all other copies returned to truck driver at site's monitoring tower. County gathers any additional copies from truck driver for QA/QC purposes.

The details associated with something as "simple" as billing often aren't considered until after a crisis is over. Working through them can take longer than actual debris removal.

### Mapping the Plan of Attack

The division activated the plan on Sept. 5, 2017, five days before Hurricane Irma made landfall.

SCS Engineers had been pre-qualified to oversee removal and disposal, so Project Director Carlo Lebron immediately assembled a team of SCS employees to coordinate with representatives from the county's pre-qualified hauling contractor: AshBritt Environmental of Deerfield Beach, Fla. (which subcontracted out additional trucks and equipment as necessary). The goal was to mobilize within 24 hours of the county's notice to proceed. SCS Engineers was responsible for:

- Conducting a countywide survey to identify dangerously leaning or hanging vegetation and stumps and estimate volume of vegetative and CD&D debris from the public right of way.
- Developing grid maps for planning daily routes and tracking progress.
- Identifying areas outside the county where removal by county contractors is prohibited.
- Monitoring removal of debris from all 20 public schools by Sept. 18.
- Monitoring removal of debris from remaining public rights of way in order of priority: public roads (first pass), stormwater system, major towns and cities, county parks, public roads (second pass), and private roads.
- Monitoring and documenting cleanup according to FEMA standards and submitting reimbursement application within six months.
- Monitoring removal from non-navigable waterways by public works crews (which involved certifying eight department vehicles).
- Monitoring the restoration of temporary disposal sites to pre-hurricane condition.

The county Information Technology Department's GIS Section breaks the 743-square-mile county into 300 grids. SCS Engineers broke these into 20 zones based on school locations, AshBritt's truck arrivals, and information flowing from the field. SCS employees traveling in company vehicles visually assessed the damage and noted debris location and type on their smartphones.

In anticipation of the 2017 hurricane season, the county preauthorized 15 temporary debris staging and reduction sites (TDSRS) to mulch vegetation before transport to designated final disposal sites. Three were designated for Hurricane Irma cleanup based on location and storage capacity. SCS conducted an environmental assessment of each site before collection began and ensured AshBritt restored each to its original condition once cleanup was complete.

### A Team with Almost 120 Members

In addition to assigning zones to removal subcontractors, SCS used zones to track AshBritt's progress. The county gave SCS a conference room at its Lena Road Landfill to serve as command and control headquarters.

Initially, trucks and field personnel met there at 6:30 every morning to receive assignments and hit the road by 7 am; however, AshBritt soon identified and permitted a more centrally located mall parking lot to meet throughout the day as additional vehicles became available. SCS's assistant operations manager maintained constant contact with AshBritt and SCS's personnel subcontractor, Thompson Consulting Services of Lake Mary, Fla., to ensure a field monitor and someone who could certify the vehicle would be ready within 30 minutes of each truck's arrival no matter the time of day.

A field monitor in a separate vehicle followed each collection truck to note debris location and type, assessed it was contaminant-free, initiate a load ticket, provide a backup in case of a breakdown (which happened a lot), and follow the truck to the disposal site. There, having been warned by the operations manager that a truck was on its way, a site monitor verified debris volume and completed the load ticket. To ensure the county and each municipality would be correctly charged for its portion of collection and disposal costs, and that the entire operation met FEMA and Florida Department of Environmental Protection requirements, the site manager reviewed each ticket. Another site monitor confirmed each truck was free of debris and contaminants when it left the site.

### Lessons Learned: Final Tweaks

Ultimately, cleaning up involved 119 monitors and 184 trucks. Crews worked 12 hours a day, seven days a week, for 99 consecutive days, breaking only three days for Thanksgiving, until the monitoring phase was complete. Employees from other SCS Engineering offices in the state temporarily relocated for weeks at a time.

### Timeline

**Debris management plan activated:** Sept. 5, 2017

**Hurricane Irma hits Manatee County, Fla.:** Sept. 10

**Schools reopen:** Sept. 18

Managing the interaction of all these elements was challenging. On the busiest days, 87 monitors were in the field, at disposal sites and managing operations in addition to removal crews.

**Initial cleanup completed:** Dec. 20  
**Final cleanup completed:** Jan. 10, 2018

The operations manager and assistant project manager were primary liaison between the county and contract team members. They managed day-to-day recovery work, coordinating staff and schedules and implementing recommendations for improving efficiency. They distributed daily reports to key personnel to help monitor progress and coordinated daily briefings with contractors and officials including the county's project manager; safety manager; and Finance, Utilities, and Communications departments. They also conducted safety inspections, oversaw debris sites, and helped county officials respond to public concerns and comments.

Many details regarding daily tactics aren't required by FEMA, but they'll be added to the county's plan to improve future cleanups. For example, instead of initially focusing on just residential areas, the plan will also prioritize removing debris within a 1-mile radius of each of the county's 20 public schools to ensure the safety of children who walk to school.

Once schools reopened, the county focused on cleaning up remaining rights of way to provide access for emergency response teams and restore a sense of normalcy for residents as quickly as possible. Although not reimbursable, the county began collecting debris from private rights of way in early November, another activity SCS oversaw. The county also opened its landfill for two weekends for residents to dump debris.

The team collected 573,866 cubic yards in 12,172 truckloads. SCS tracked every phase of cleanup to compile a final report that documents the entire process, successful practices as well as lessons learned. Copies of all data collected, including manifests, certificates, logbooks, and load tickets, are included to help guide the county's next cycle of disaster preparedness planning.

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