Substantial Damage Data

Supporting Recovery – Lessons Learned from Hurricane Isaac
Substantial Damage Definition

Damage of any origin sustained by a structure whereby the cost of restoring the structure to its pre-damaged condition would equal or exceed 50% of the market value of the structure before the damage occurred.
Why should you worry about Substantial Damage Determinations?

If your community participates in the NFIP you have responsibilities to maintain NFIP eligibility including:

- Determining whether work necessary to restore a damaged building to its pre-damage condition constitutes repair of "substantial damage" - for existing buildings that are located in SFHAs

- Repair of substantially damaged buildings triggers requirements for permits and compliance.

Ref: NFIP regulations contained in 44 CFR § 59.22 and § 60.3
SD & Recovery Overview

A Substantial Damage determination is one of the earliest decision points in the local recovery process.

Starting post-incident substantial damage data collection as early as possible is critical for shortening recovery time.

Beyond permitting, substantial damage determination data can support:

- Recovery project development
- Unmet needs assessments
- Future response strategies
Data Collection – Where to start

The Substation Damage Estimator (SDE) tool – Version 2.0.2 is a desktop tool developed by URS for FEMA.

- SDE assists State and local officials in using FEMA-accepted approaches to estimate the value of a building and determine costs to repair or rebuild.
- SDE is designed to accommodate residential and nonresidential buildings.
- Communities that participate in the NFIP are not required to use the SDE software to determine substantial damage, however the use of SDE is highly encouraged.
Data Collection Challenges

- The SDE tool was built for communities and focuses on producing reports for data collection activities
  - Stand alone MS Access database limits number of simultaneous users
  - Data latency – data not reviewed until staff return to office
  - Static view of data – each field team stores data in separate databases (no global view)
  - Photo management using external camera – significant resources required to manage and upload photos into SDE
Data Collection Challenges

- There are scalability issues for collection and rapid delivery of large inventories of structures
- Field teams required to carry numerous pieces of equipment
  - Large number of data entry fields required to be populated in the field
  - Limited assignment functionality
  - Lack of data QC tools
  - Data management skills needed to combine numerous field team data sets into one central, community database
Lessons Learned from Hurricane Isaac
Louisiana SDE Process

- Key Characteristics
  - No paper data collection
  - Centralized data processing in office location
  - Mission Planning by extracting community GIS data
  - Augmented use of ancillary datasets to improve QA/QC
  - Loosely connected toolsets facilitated program’s workflow
# Lessons Learned from Hurricane Isaac

## Benefits of Available Robust Community Data Sets

<table>
<thead>
<tr>
<th>Parish 1</th>
<th>Parish 2</th>
</tr>
</thead>
</table>
| • 2839 Structures  
• 16 days  
• Avg 177 Structures/Day | • 1039 Structures  
• 11 days  
• Avg 94 Structures/Day |

<table>
<thead>
<tr>
<th>Data Available</th>
<th>Address or Lat/Long</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Addresses</td>
<td></td>
</tr>
</tbody>
</table>

Available robust data sets allowed same team to visit 88.2% more structures in similar time period

**BENEFITS:**
- Cost Savings
- Earlier Determinations
- Ability to Begin Rebuilding Earlier

<table>
<thead>
<tr>
<th>Data URS Obtained</th>
<th>None</th>
<th>ABFE Data (dFIRM)</th>
</tr>
</thead>
</table>

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Mission Planning: Available Tools
# Lessons Learned from Hurricane Isaac

## Results from Enhanced LA Process

<table>
<thead>
<tr>
<th></th>
<th>Mississippi</th>
<th>Louisiana</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Structures</td>
<td>2,281</td>
<td>5,407</td>
</tr>
<tr>
<td>Teams (2 staff/team)</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Field Collection (Weeks)</td>
<td>7</td>
<td>5.25</td>
</tr>
<tr>
<td>Structures/Day (per team)</td>
<td>12.7*</td>
<td>21.5</td>
</tr>
</tbody>
</table>

* Estimated

> 50% Cost Reduction
URS Approach for Improved Data Collection

Field Data Collection Efforts Streamlined into One Tablet Device

- Cameras
- GPS Units
- SDE Data Collection Tablet
- Paper Forms
- Laptop
The URS Data Collection Solution

Handheld Tablets
All the Functionality Built Right In

- Custom built application(s)
- Touch screen display
- Internet connectivity (4G-WiFi)
- GPS
- Local and SD card storage (for intermittent connectivity)
- Front and rear-facing HD camera with built in flash – still and video
- Voice recognition
Data Management Overview

URS will work with local officials to acquire Geospatial data for assignment & data augmentation through the URS Assignment Tool.

Field personnel will collect SDE data, photo, and GPS coordinates quickly and easily with the URS Mobile Field Data Collection Tool.

Mobile user will export all data and photos to a secure web service.

Data will be available in the URS Mobile Dashboard for QA/QC.

The QA/QC’d data will be exported into SDE for complete SDE functionality or exported in KMZ format for Geospatial analysis.

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Tiered Data Collection for SDE

- Tier 1 – Estimated damage to structure:
  - 95% of structures in Tier 1 and 3
  - 5% of structures in Tier 2

LA SDE Data Collection resulted in:

Benefits of URS Revised Approach:
- Cost Savings
- Earlier Determinations
- Ability to Begin Repair Earlier for 95% of structures
## URS Enhancements Post-Hurricane Isaac

### Results from Mobile Data Collection Suite

<table>
<thead>
<tr>
<th></th>
<th>Reduced Field Data Collection</th>
<th>Full Field Data Collection</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of Structures</strong></td>
<td>500+</td>
<td>500+</td>
</tr>
<tr>
<td><strong>Structures/Day (per team)</strong></td>
<td>100*</td>
<td>30*</td>
</tr>
<tr>
<td><strong>Mobilization Cost</strong></td>
<td>1 Time</td>
<td>1 Time</td>
</tr>
</tbody>
</table>

* Estimated based on similar efforts
Benefits of Effective Data Collection

- Reduces overall time to complete field inspections
- Reduces data management burden for local communities
- Reducing data entry burden reduced required number of field staff
- Real-time SDE data transmittal from field reduces lag in permitting process
- Minimize duplicative collection efforts
- Residents and Businesses can begin rebuilding faster
Takeaways

Save time and money utilizing mobile-based solutions

Start Early

Integrate Process & Tools

SDE data not just for permitting

Leads to shortened recovery time

Field data is tracked 100% electronically from beginning to end, reducing time, money, & error

- Recovery project development
- Unmet needs assessments
- Future response strategies
Points of Contact

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