M7.2 Haiti Earthquake

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DATA REPORT

Members of the Sud Data Collection Team in the field (left) and Nippes Data Collection Team members training on the Fulcrum App (right).

Mission Coordinators **University of Notre Dame**	**Mission Coordinators** **GeoHazards International**	**Data Librarians** **University of Notre Dame**
Lead: Tracy Kijewski-Correa Lamarre Presuma	**Lead:** Janise Rogers Gefthé Dévilmé	**Lead:** Angelique Mbabazi Eric Canales Meredith Lochhead

Haitian Data Collectors
(in alphabetical order, by Department)

Sud Department	**Nippes Department**	**Grand Anse Department**
Esai Castel	Renand Alferus	Rose Esther Andre
Porky Jean Deronce	Kattie Desravines	Stanley Belfort
Magdala Felix	Roseline Elasme	Steevenson Galety
Gad Guillard Firma	James Guerrier	Andre Gravenet
Rochelin Forzene	Genèse Hyppolite	Gede Jean Benoit
Gervain Joseph	Opont Israel	Kattia Lafargue
Veronique Joseph	Cassandra Joseph	Fanfan Lifodyl
Ezechiel Landy Chery	Kerven Lafortune	Jean-Baptiste Louimard
Ronkyel Laplante	Marie France Laurent	Jonel Pierre
Charmelle Lexis	Duckens Lesperance	Jean Alfred Presume
	Joseph Louis	Jean Kada Prospere
	Emmanuel Merosier	
	Premise Painvin	

	Junithe Pierre Albert Saint Cyr Midclief Sanon Leliene Severin Perpetue Souriac Ronald Surpris Archely Verne	
Remote Assessors: Volunteer Engineers (in alphabetical order)		
Keith Adams* Ozge Akin Yasemin Aktas Mohammad Alam Esther Baas Rodrigo Bezerra Andrade Sujit Bhandari Jacob Black* John C Smith Victor Calderon Julian Carrillo Jackie Celin Yasemin D. Aktas* Hossein Derakhashan Luigi Di Sarno * Elizabeth Diaz Wilfrid Djima Kökcan Dönmez* Jazalyn Dukes Isabela Durci Rodrigues	Delka Espinal Tal Fenstein Mahtab Foroughnia Fatemeh Foroughnia* Sergio Gargia Mejia Mikael Gartner Giorgia Giardina* Jaime Guaman Abhineet Gupta Andréia Horta Alvares da Silva Jieun Hur Sri Kalyana Rama J David Lallemant Ting Lin Priscillah M. Josh Macabuag* Valentina Macchiarulo Valentina Macchiarulo* Marko Marinković	Jorge Mario Lozano Eduardo Marques Vieira Pereira Amory Martin Yvonne Merino Pena Pietro Milillo* Hamidatou Mouloud Polly Murray Esther Obonyo Mobin Ojaghi Alessandra Orfeo* Camilla Penney* Francesco Pugliese* Valentina Putrino Michael R. Z. Whitworth* Raul Rincon Alex Rogers Xavier Romao Sagar Shekhar Tripathy Taikhum Vahanvaty Jorge Vasquez Reid Zimmerman
*member of the EEFIT Team		
Remote Assessors: Engineering Students (in alphabetical order, by Department)		
Evan Ackerman Candace Atchison Hernan Barajas Bryan Barriga Ryan Bencivengo Tatiana Boehning	Shengpei Jin Nolan Kyhl Andrew Lauerman Owen Linczer Richard Lohre Nicole Lopez	Inyam Ricketts Nico Roman Dinglasa Zachary Safford Patricia Salazar Laura Schaffler Patrick Schlosser

Jillian Bowen	Haoquan Luo	Izak Schmidlkofer
Brittany Bullard	Kimberly Marfo	Clare Seymour
Liz Chen	Serra Marquez	Mohamed Sherif
Renhui Chen	Ainee Martin	Runyi Shi
Rayna Choi	Katherine Matustik	Reed Snedeker
Andrew Clements	Elena Morgan	Thukha Soe
Patrick Conklin	Matthew Mukai	Minsub Song
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Matthew Egan	Oscar Pontiff	Evan Wood
Ella Gerczak	Pedro Pozas	Daniel Yu
Amr Ghanem	Daniel Pronko	Andrew Yu
Jaden Glover	Shannon Reilly	Anna Zielinski
Amanda Handt	Owen Richey	Katherine Zinkan
Stephen Heritage	Bradley Richman	

PREFACE

The National Science Foundation (NSF) awarded an EAGER grant (CMMI 1841667) to a consortium of universities to form the Structural Extreme Events Reconnaissance (StEER) Network (see https://www.steer.network for more details). StEER was renewed through a second award (CMMI 2103550) to further enhance its operational model and develop new capabilities for more efficient and impactful post-event reconnaissance. StEER builds societal resilience by generating new knowledge on the performance of the built environment through impactful post-disaster reconnaissance disseminated to affected communities. StEER achieves this vision by: (1) deepening structural engineers' capacity for post-event reconnaissance by promoting community-driven standards, best practices, and training, as well as their understanding of the effect of natural hazards on society; (2) coordination leveraging its distributed network of members and partners for early, efficient and impactful responses to disasters; and (3) collaboration that broadly engages communities of research, practice and policy to accelerate learning from disasters.

Under the banner of the Natural Hazards Engineering Research Infrastructure (NHERI) CONVERGE node, StEER works closely with the wider Extreme Events Reconnaissance consortium to promote interdisciplinary disaster reconnaissance and research. The consortium includes the Geotechnical Extreme Events Reconnaissance (GEER) Association and the networks for Interdisciplinary Science and Engineering Extreme Events Research (ISEEER), Nearshore Extreme Event Reconnaissance (NEER), Operations and Systems Engineering Extreme Events Research (OSEEER), Social Science Extreme Events Research (SSEER), Sustainable Material Management Extreme Events Reconnaissance (SUMMEER), and Public Health Extreme Events Research (PHEER), as well as the NHERI RAPID equipment facility, the NHERI Network Coordination Office (NCO), and NHERI DesignSafe CI, curation site for all StEER products.

While the StEER network currently consists of the three primary nodes located at the University of Notre Dame (Coordinating Node), University of Florida (Southeast Regional Node), and University of California, Berkeley (Pacific Regional Node), StEER is currently expanding its network of regional nodes worldwide to enable swift and high quality responses to major disasters globally.

StEER's founding organizational structure includes a governance layer comprised of core leadership with Associate Directors for each of the primary hazards as well as cross-cutting areas of Assessment Technologies and Data Standards, led by the following individuals:

- **Tracy Kijewski-Correa (PI),** University of Notre Dame, serves as StEER Director responsible for overseeing the design and operationalization of the network and representing StEER in the NHERI Converge Leadership Corps.
- **Khalid Mosalam (co-PI),** University of California, Berkeley, serves as StEER Associate Director for Seismic Hazards, serving as primary liaison to the Earthquake Engineering community.
- **David O. Prevatt (co-PI),** University of Florida, serves as StEER Associate Director for Wind Hazards, serving as primary liaison to the Wind Engineering community.
- **Ian Robertson (co-PI),** University of Hawai'i at Manoa, serves as StEER Associate Director for Coastal Hazards, serving as a primary liaison to the coastal engineering community and ensuring a robust capacity for multi-hazard assessments.
- **David Roueche (co-PI),** Auburn University, serves as StEER Associate Director for Data Standards, ensuring StEER processes deliver reliable and standardized reconnaissance data suitable for re-use by the community.

This core leadership team works closely with StEER Research Associates, Data Librarians and its Student Administrator in event responses, in consultation with its Advisory Boards for Coastal, Seismic and Wind Hazards.

ATTRIBUTION GUIDANCE

Citing Images, Data or Data Derivatives from this Dataset

The use of images from this published data set and the use of these or any other data to conduct additional analyses or prepare various visualizations or data derivatives should use the full citation information and DOI from DesignSafe (these are available at https://www.steer.network/responses).

ACKNOWLEDGMENTS

This material is based upon work supported by the National Science Foundation under Grant No. CMMI 2103550. Any opinions, findings, and conclusions or recommendations expressed in this material are those of StEER and do not necessarily reflect the views of the National Science Foundation. All authors and editors listed on the cover page participate as volunteer professionals. Thus, any opinions, findings, conclusions or recommendations expressed herein are those of the individual contributors and do not necessarily reflect the views of their employer or other institutions and organizations with which they affiliate.

This work is the result of a sustained collaboration between the authors and GeoHazards International; we are particularly grateful to Janise Rodgers, Gefthe Dévilmé for their fruitful partnership on this project. The authors also wish to thank colleagues in the Structural Extreme Events Reconnaissance (StEER) Network who assisted in the development of guidance for remote assessors, specifically Khalid Mosalam and Eduardo Miranda. The authors are further indebted to the dozens of Haitian citizens who led data collection for this project, as well as the hundreds of volunteer engineers who assessed their data, with particular gratitude for the partnership with the Earthquake Engineering Field Investigation Team (EEFIT). The authors also wish to thank Notre Dame team members Edson Jean for his translation efforts and Dinah Lawan for her coordination assistance, as well as Keegan Wolohan for support in curating the project. Dialog and input from David Wald and other colleagues at USGS is also greatly appreciated.

The hybrid model was developed with the support of the National Science Foundation (NSF) under grant CMMI-1841667, the World Bank (Contract No. 7203159), and the University of Notre Dame through the Kellogg Institute of International Scholars Program and the Paula A. Connors fund. Data collection relied upon these funds, as well as support from the U.S. Geological Survey (USGS) and the U.S. Agency for International Development (USAID), under USGS Cooperative Agreement No. G21AC10343-00 and USAID Award AID-OFDA-T-16-00001, through a subcontract under a collaborative project with GeoHazards International.

Special thanks to Spatial Networks for their ongoing partnership and generous support, making available, at no cost, the Fulcrum mobile platform for StEER.

The sharing of videos, damage reports, and briefings via Slack by the entire NHERI community was tremendously helpful and much appreciated. StEER recognizes the efforts of the DesignSafe CI team who continuously supported and responded to StEER's emerging needs.

For a full listing of all StEER products (briefings, reports and datasets) please visit the StEER website: https://www.steer.network/responses

Common Terms & Acronyms

Acronym	General Terms	Brief Description
--	DesignSafe	Data Repository
--	DesignSafe-CI	Academic Organization within NHERI
ASCE	American Society of Civil Engineers	Professional Organization
ASTM	American Society for Testing and Materials (now ASTM International)	Standards Body
ATC	Applied Technology Council	Professional Organization
BOCA	Building Officials and Code Administrators	Code Body
CC-BY	Creative Commons Attribution License	Code/Standard
CESMD	Center for Engineering Strong Motion Data	Governmental Agency
CFE	Comision Federal de Electricidad = Federal Electricity Commission [in English].	State owned electricity utility in Mexico
CI	Cyberinfrastructure	Research Asset
CLPE	Critical Load Path Elements	StEER Term
CMU	Concrete Masonry Unit	Building Material
CONAGUA	National Water Commission [English translation]	Mexican Government Agency
CWA	Central Weather Administration	Taiwan Governmental Agency
DBE	Design Basis Earthquake	Design Terminology
DEQC	Data Enrichment and Quality Control	StEER Term
DIF	National Integral Family Development System	Mexican Agency
DOI	Digital Object Identifier	Common Term
EARR	Early Access Reconnaissance Report	StEER Term
EERI	Earthquake Engineering Research Institute	Professional Organization
EEFIT	Earthquake Engineering Field Investigation Team	Professional Organization
EF	Enhanced Fujita Scale	Hazard Intensity Scale
EF	Equipment Facility	Academic Organization within NHERI
EIFS	Exterior Insulation Finish System	Building Component
FAA	Federal Aviation Administration	Governmental Agency

FAQ	Frequently Asked Questions	Common Term
FAST	Field Assessment Structural Team	StEER Term
FEMA	Federal Emergency Management Agency	Governmental Agency
FIRM	Flood Insurance Rate Maps	Regulatory Product
GEER	Geotechnical Extreme Events Reconnaissance	Academic Organization within NHERI
GPS	Global Positioning System	Measurement Technology
GSA	Government Services Administration	Governmental Agency
HVAC	Heating, ventilation and air conditioning	Building System
HWM	High Water Mark	Intensity Measure
IBC	International Building Code	Code/Standard
ICC	International Code Council	Code Body
IFT	Federal Telecommunications Institute [English translation]	Mexican Government Agency
IRC	International Residential Code	Code/Standard
ISEEER	Interdisciplinary Science and Engineering Extreme Events Research	Academic Organization within NHERI
LiDAR	Light Detection and Ranging	Measurement Technology
MCE	Maximum Considered Earthquake	Design Terminology
ME&P	Mechanical, electrical and plumbing	Building System
MMI	Modified Mercalli Intensity	Hazard Intensity Scale
NBC	National Building Code	Code/Standard
NEER	Nearshore Extreme Event Reconnaissance	Academic Organization within NHERI
NFIP	National Flood Insurance Program	Government Program
NHERI	Natural Hazards Engineering Research Infrastructure	Academic Organization within NHERI
NIST	National Institute of Standards and Technology	Governmental Agency
NOAA	National Oceanic and Atmospheric Administration	Governmental Agency
NSF	National Science Foundation	Governmental Agency
NWS	National Weather Service	Governmental Agency

OSB	Oriented strand board	Construction Material
OSEEER	Operations and Systems Engineering Extreme Events Research	Academic Organization within NHERI
PEER	Pacific Earthquake Engineering Research center	Academic Organization (Earthquakes)
PGA	Peak Ground Acceleration	Intensity Measure
PHEER	Public Health Extreme Events Research	Academic Organization within NHERI

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1.0 Event Summary and Team Configuration

As summarized in Kijewski-Correa et al. (2021), a magnitude 7.2 earthquake with epicenter coordinates 18.408°N 73.475°W and a depth of 10 km struck 13 km SSE of Petit Trou de Nippes in Haiti at approximately 8:29 am local time on 14 August 2021, affecting a wide swath of the Tiburon Peninsula, including the Departments of Nippes, Sud, and Grand'Anse. This earthquake resulted from an oblique reverse motion along the Enriquillo Plantain Garden fault zone, 75 km west of the 2010 Mw 7.0 earthquake epicenter. In addition to widespread destruction in the Nippes Department, the earthquake affected major city centers on the north and south coasts (Jeremie and Les Cayes, respectively), both still recovering from 2016's Hurricane Matthew. With the 14 August 2021 earthquake and its subsequent aftershocks affecting three departments of Haiti, the geographic expanse and intensity of this event are actually greater than the 2010 earthquake, exposing a more diverse cross-section of regional construction practices to strong shaking. Additional details of the hazard characteristics and resulting damage, as distilled from public reports and field observations, were documented in StEER's prior publication(s) on this event:

Preliminary Virtual Reconnaissance Report (PVRR)	https://doi.org/10.17603/h7vg-5691
Early Access Reconnaissance Report (EARR)	DOI Pending

Reports of widespread damage prompted the Structural Extreme Events Reconnaissance (StEER) Network to initiate a Level 1 response, activating a Virtual Assessment Structural Team (VAST) on the day of the earthquake to begin the compilation of third-party data and social media reports to inventory the damage across the three affected departments. These early damage reports warranted an immediate escalation to a Level 2 response, which would normally instigate a rapid assessment of damage using street-level panoramic imaging collected by a Field Assessment Structural Team (FAST). However, security concerns prohibited StEER members from deploying to Haiti with these imaging platforms. The travel restrictions prompted the development of a hybrid response relying on local data collectors to collect ephemeral field data necessary for a basic performance assessment using smart phones, with engineers working remotely to review that data and complete the performance assessment. This model is described in Kijewski-Correa et al. (2024). Note that this effort eventually included a modified USGS Did You Feel It? Survey, but this is not included in this dataset (or discussed in this Data Report) since this was in direct response to a request from USGS and funded separately.

The data collection effort commenced in the Sud Department on 20 August 2021 with rapid assessments conducted initially under the direction of StEER. By 30 August, GeoHazards International (GHI) joined the effort to expand data collection in the Nippes Department, near the earthquake's epicenter. Data collection efforts continued under the supervision of GHI and StEER's lead institution, the University of Notre Dame (UND), enabling an expansion of efforts in the Sud and Nippes Departments and the addition of data collectors in the Grand'Anse Department by 28 September. All data collection for rapid assessments concluded by October 29. See Table 1.1 for the list of the field data collectors, organized by department.

Remote assessments of the locally-collected data by professional engineers and engineering students ran in parallel with those efforts and continued into early 2022. Engineers who volunteered to assist with the effort, including GHI engineers, were initially tasked with assessing

non-residential construction. The Earthquake Engineering Field Investigation Team (EEFIT) later conducted a range of analyses (Whitworth et al., 2022), aiding in the remote performance assessment efforts. See Table 1.2 for the list of engineers who volunteered as virtual assessors.

Residential construction, which is non-engineered and often informally constructed but a sizable proportion of the dataset, was assessed by teams of engineering students at the University of Notre Dame (see Table 1.3). As part of this process, the dataset underwent an enrichment and quality control process led by a team of student data librarians and a contracted translator listed in Table 1.4.

Table 1.1: Haitian Data Collectors

Sud Department	**Nippes Department**	**Grand'Anse Department**
Esai Castel Porky Jean Deronce Magdala Felix Gad Guillard Firma Rochelin Forzene Gervain Joseph Veronique Joseph Ezechiel Landy Chery Ronkyel Laplante Charmelle Lexis	Renand Alferus Kattie Desravines Roseline Elasme James Guerrier Genèse Hyppolite Opont Israel Cassandra Joseph Kerven Lafortune Marie France Laurent Duckens Lesperance Joseph Louis Emmanuel Merosier Premise Painvin Junithe Pierre Albert Saint Cyr Midclief Sanon Leliene Severin Perpetue Souriac Ronald Surpris Archely Verne	Rose Esther Andre Stanley Belfort Steevenson Galety Andre Gravenet Gede Jean Benoit Kattia Lafargue Fanfan Lifodyl Jean-Baptiste Louimard Jonel Pierre Jean Alfred Presume Jean Kada Prospere

Table 1.2: Remote Assessors for Non-Residential Construction

Keith Adams* Ozge Akin Yasemin Aktas Mohammad Alam Esther Baas Rodrigo Bezerra Andrade Sujit Bhandari Jacob Black* John C Smith Victor Calderon Julian Carrillo Jackie Celin Yasemin D. Aktas* Hossein Derakhashan Luigi Di Sarno * Elizabeth Diaz Wilfrid Djima Kökcan Dönmez* Jazalyn Dukes Isabela Durci Rodrigues	Delka Espinal Tal Fenstein Mahtab Foroughnia Fatemeh Foroughnia* Sergio Gargia Mejia Mikael Gartner Giorgia Giardina* Jaime Guaman Abhineet Gupta Andréia Horta Alvares da Silva Jieun Hur Sri Kalyana Rama J David Lallemant Ting Lin Priscillah M. Josh Macabuag* Valentina Macchiarulo Valentina Macchiarulo* Marko Marinković	Jorge Mario Lozano Eduardo Marques Vieira Pereira Amory Martin Yvonne Merino Pena Pietro Milillo* Hamidatou Mouloud Polly Murray Esther Obonyo Mobin Ojaghi Alessandra Orfeo* Camilla Penney* Francesco Pugliese* Valentina Putrino Michael R. Z. Whitworth* Raul Rincon Alex Rogers Xavier Romao Sagar Shekhar Tripathy Taikhum Vahanvaty Jorge Vasquez Reid Zimmerman
*members of EEFIT		

Table 1.3: Remote Assessors for Residential Construction		
Evan Ackerman	Shengpei Jin	Inyam Ricketts
Candace Atchison	Nolan Kyhl	Nico Roman Dinglasa
Hernan Barajas	Andrew Lauerman	Zachary Safford
Bryan Barriga	Owen Linczer	Patricia Salazar
Ryan Bencivengo	Richard Lohre	Laura Schaffler
Tatiana Boehning	Nicole Lopez	Patrick Schlosser
Jillian Bowen	Haoquan Luo	Izak Schmidlkofer
Brittany Bullard	Kimberly Marfo	Clare Seymour
Liz Chen	Serra Marquez	Mohamed Sherif
Renhui Chen	Ainee Martin	Runyi Shi
Rayna Choi	Katherine Matustik	Reed Snedeker
Andrew Clements	Elena Morgan	Thukha Soe
Patrick Conklin	Matthew Mukai	Minsub Song
Kerry Conneely	Diane Musabese	Hananiah Tangpuz
Dorothy Crumlish	Sofia Nelson	Dastan Tursaliev
Hailee Dalgleish	Daniel Noronha	David Wang
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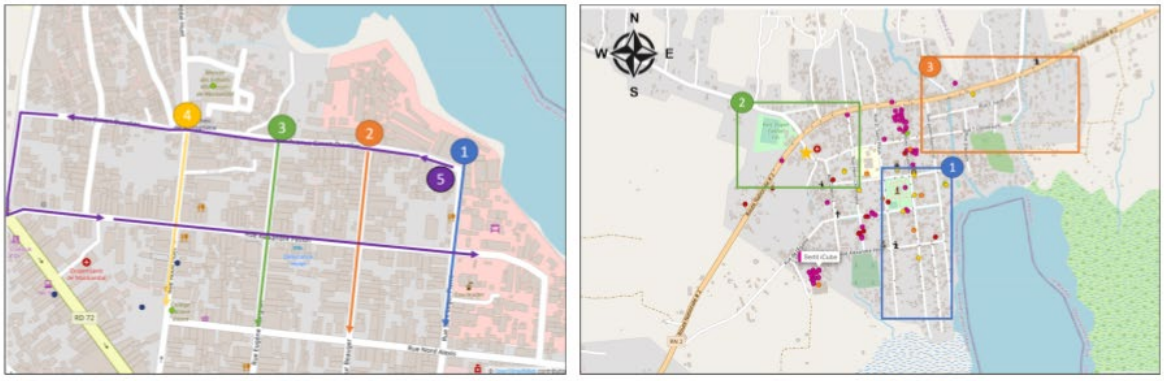
Joseph Edwards	Obioha Onwuanibe	Marissa White
Matthew Egan	Oscar Pontiff	Evan Wood
Ella Gerczak	Pedro Pozas	Daniel Yu
Amr Ghanem	Daniel Pronko	Andrew Yu
Jaden Glover	Shannon Reilly	Anna Zielinski
Amanda Handt	Owen Richey	Katherine Zinkan
Stephen Heritage	Bradley Richman	

Table 1.4: Data Librarians & Translator	
Name	**Affiliation**
Angelique Mbabazi (Lead)	University of Notre Dame
Eric Canales	University of Notre Dame
Meredith Lochhead	University of Notre Dame
Jean Edson (Translator)	Private Contractor

2.0 Data Collection Methodology

With three affected departments and damage in urban, peri-urban, and rural areas, speed and broad coverage were prioritized. Field data collectors were assigned geographies where performance assessments were to be conducted each day. The objective was to capture a representative sample of different building classes (residential, schools, commercial, government, medical/critical facilities) in each affected department. The selection of sites for data collection in each department prioritized localities based on their reported damage levels (referenced against projected ground shaking levels from USGS), building density and diversity of inventory (for greater efficiencies in data collection), and ease of access (localities along primary roads that had been cleared/repaired since the earthquake). Then as resources allowed and landslides were cleared, smaller, rural communities were added to the sample. The only deviation from this strategy was near Saint Louis du Sud, where every accessible structure within 1 km of the one known ground motion station was assessed. Unfortunately, resources and feasibility ultimately constrained the scope of the data collection efforts, particularly as the situation further deteriorated.

Data collectors would mobilize in teams of 2-5 persons traveling by moto to their assigned zone or route. In order to generate an unbiased sample of building performance, field data collectors working in urban areas were assigned a new route each day; zones (polygons) were assigned to each data collector working in peri-urban and rural areas. These routes and zones were communicated each morning through annotated maps (see Fig. 2.1), transmitted by WhatsApp.



(a) (b)

Fig. 2.1. Examples of maps communicated daily to field data collectors to define the (a) route or (b) zone each team member should sample along/within for that day. Example (a) is from Jeremie (urban zone) and (b) Aquin (peri-urban zone).

Within their assigned daily zone or along their assigned daily route, local data collectors created a performance assessment in the **StEER Rapid Response (M7.2 Haiti EQ - Aug 2021) App** in Fulcrum for every third building encountered on their walking path with two important exceptions: they would assess every standard-plan home constructed by a non-governmental organization (NGO) and every critical facility (schools, hospitals/clinics, government/assembly buildings). If they were at a site that had multiple buildings like a school or hospital compound, they would create a separate Performance Assessment in Fulcrum for each building in the compound. As the Fulcrum platform synchronizes records as connectivity allows, field data collectors saw pins

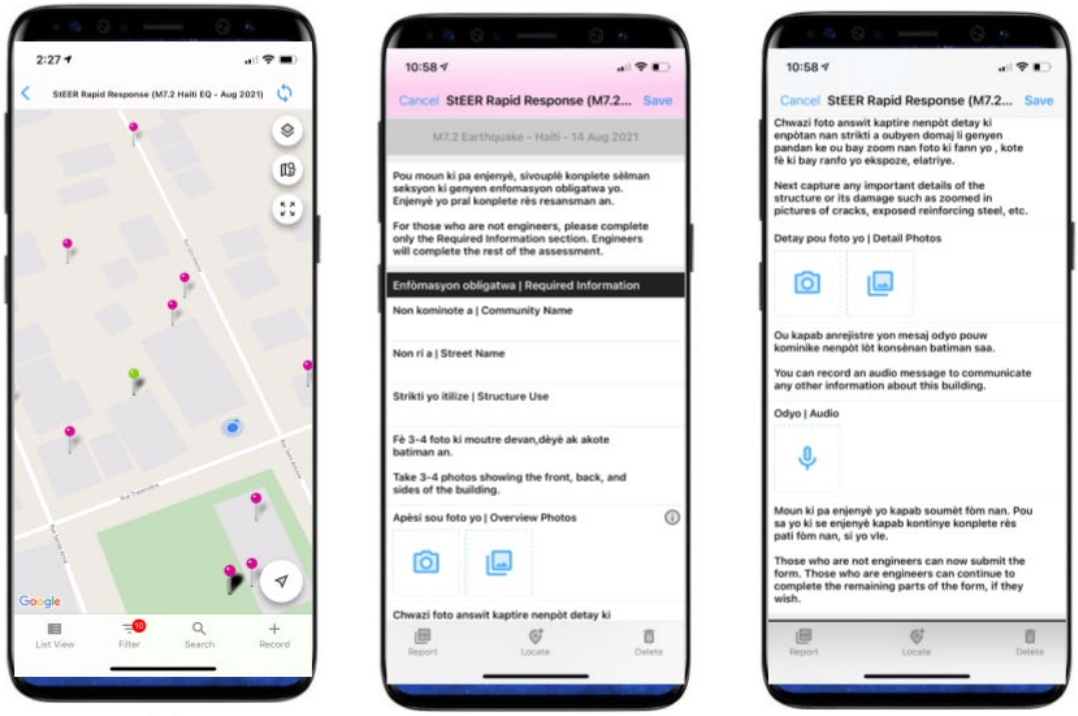
on their maps for every structure that had already been assessed, ensuring no duplicate records were created.

2.1 Building Performance Assessments

IMPLEMENTATION: Hybrid Assessment
PUBLIC ACCESS POINT: FulcrumApp.com

Records were created in Fulcrum by field data collectors who had no technical background but hailed from the departments they surveyed and were thus familiar with the communities assessed. The data collectors received basic training on the use of the mobile platform, optimal device configuration, and data collection procedures. The app systematized the routine data collection steps normally conducted by an engineer so the field data collectors could execute them efficiently: (1) geolocating the structure on OpenStreetMaps base maps, using the positioning tools available in Fulcrum and their mobile device's GPS, and manually providing the locality name, commune and department, (2) supplying general information on the structure's occupancy from predefined categories, along with at-a-distance Overview Photos from all sides of the building (if accessible), and (3) details of observed damage through up-close Detail Photos contextualized by audio recordings (see Fig. 2.2). Field data collectors were encouraged to take pictures of any official signage or posted placards. The field data collectors could also record an audio file with any details about the building from bystanders, e.g., who built the building, its age, specifics of its construction, and its performance in the earthquake. Once synchronized on Fulcrum's back end, the records would be further enhanced by the virtual assessors, as discussed later in Section 4.1.

See Appendix A for a listing of all the app fields, both those populated by local data collectors in the field, those remotely completed by virtual assessors, and those updated by the data librarians/translator.



(a) (b) (c)

Fig. 2.2. Screen captures of mobile app supporting tasks paraskilled to local data collectors: (a) geolocation using Open Street Maps (blue dot is assessor location, pins are locations where records have been completed), (b) supplying general information and overview photos, (c) capturing detailed photos of damage and audio recordings.

3.0 Chronology and Geospatial Distribution of Data Collection

The chronology and geospatial coverage of the FAST is summarized in Table 3.1. Daily geographic coverage is detailed in Appendix B. Figure 3.1 shows a distribution of the 12,560 records that were obtained, which cluster around the major population centers in the three surveyed departments. Another notable cluster of records in the Sud Department, near the town of St. Louis du Sud, around the one ground motion station that was operational at the time of the earthquake.

Table 3.1. Chronology of Data Collection Efforts

14 Aug.	20 Aug.	30 Aug.	20 Sept.	28 Sept.	8 Oct.	29 Oct.
M7.2 Event	Sud Launch	Nippes Launch	Sud Expands	Grand' Anse Initiates	Sud* & Nippes conclude	Grand' Anse concludes
	Sud Data Collection					
		Nippes Data Collection				
				Grand'Anse Data Collection		
		Virtual Assessment & Data Analysis				

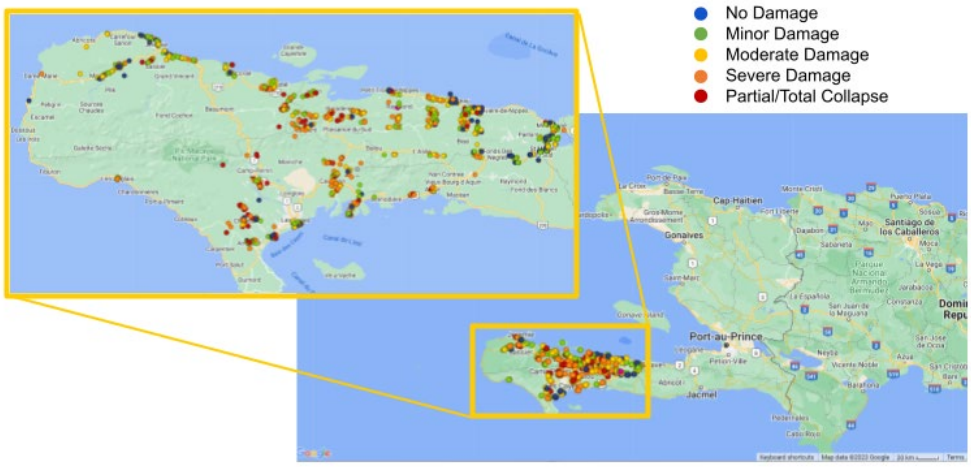


Fig. 3.1. Geospatial distribution of rapid assessments completed following the 2021 Haiti earthquake, color-coded by assigned damage rating

4.0 Data Processing

4.1 Quality Control Processes

Each record was visually screened to ensure it each had at least two overview photos of sufficient quality (included most or all of the building, was not blurry or hazy due to humidity, etc.). Records that did not have at least two usable photos were deleted. All photos were also screened for human faces; any photos with detected faces were corrected with a blurring technique.

In some cases, GPS resolution was low on the data collector's phone due to poor satellite coverage. In these cases, Fulcrum still reports a low accuracy location that was used to update the coordinates for that record. Such records received a special DE/QC code (see Section 4.5).

In other cases, low battery modes unknowingly disabled the GPS on local data collector's phones, leading to records with no geolocation. In such cases, if the locality's name, commune and department were provided by the local assessor, a default coordinate was manually applied, corresponding to the designated central latitude and longitude for the community. See Appendix C for the defaults chosen. Such records also received a special DE/QC code (see Section 4.5).

If the record lacked geocoding and the name of the locality, no geolocation could be assigned. These were deleted from the database.

4.2 Enrichment by Translator

Audio files were translated and transcribed by a US-based translator. Although integral, translation and transcription are tedious processes; thus only 3655 (39.02%) out of 9366 records with translations were successfully translated with the limited resources available to pay for translation/transcription services. Given these constraints, translation efforts were focused on non-residential construction. See Appendix D for translation completion rates by occupancy class.

4.3 Enrichment by Remote Engineers

Engineers who volunteered to assess data remotely were provided the following guidance documents to aid in the interpretation of Haitian construction:

- **Data Enrichment & Quality Control Handbook:** explains the remote assessment process to be conducted on each assigned record.
- **Video: Updating Fulcrum records for virtual assessments:** explains how to log into Fulcrum and use its features to complete the remote assessment process.
- **Assessment Guide:** Abbreviated guidance document summarizing the process of classifying structures based on Haitian construction norms and assigning damage ratings.
- **Assessment Manual:** Additional examples and explanations to assist in classifying construction types and damage in Haiti (referenced by the Assessment Guide).

These guidance documents were written specifically for the Haitian context based on the experiences of StEER PI Tracy Kijewski-Correa assessing damage in the 2010 earthquake and Hurricane Matthew. The assessment process was tailored for two common Haitian typologies. These typologies were organized using a schema with concrete and masonry and timber subclasses (see Fig. 4.1). Timber systems were classified as Wood with stone infill or Wood light

frame (clad with lightweight materials). Concrete and masonry classifications are more nuanced due to variable implementation practices in Haiti, e.g., masonry buildings may partition walls along their length but fail to adequately confine openings or the top of walls. Distinguishing the nuance between an infill frame, properly confined masonry, or weakly confined unreinforced masonry only from images captured at a distance can be challenging, so guidance included a number of visual cues identified in prior fieldwork after the 2010 earthquake. This enabled assessors to assign the primary structural system as Unreinforced Masonry Bearing Wall Buildings, Reinforced Masonry Bearing Wall Buildings (evidence of reinforcing steel at the top of the wall), Confined Masonry Building (presence of any confining elements), Concrete Frames with Infill Masonry Shear Walls (column sized thicker than infill). Any other systems were assigned as “Other”.

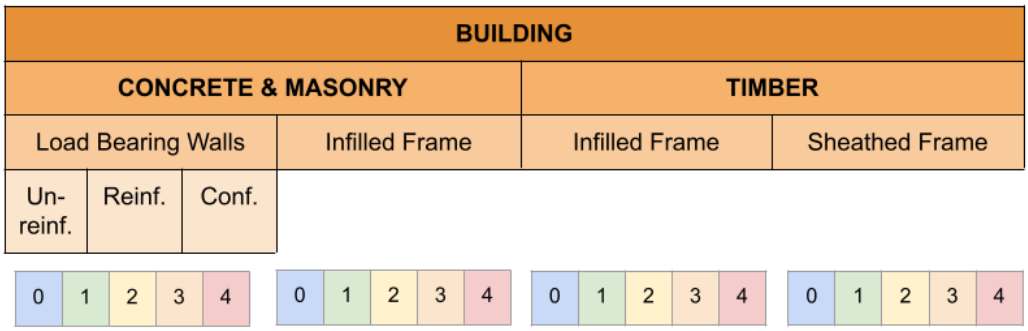


Fig. 4.1. Schema for classifying building typologies in Haiti, each with specific guidance for assigning damage assessment on a 5-point rating scale.

Damage ratings for each typology class followed a 5-point EMS-98-compatible (Grünthal 1998) scale (see Table 4.1). Partial and total collapse were treated the same for the purposes of assessment as both violated a life safety performance objective. As the damage ratings focused on the loss of vertical load-carrying capability and system-level stability, their interpretation varied based on typology.

Table 4.1. EMS-98-compatible damage ratings, interpreted for two primary typologies in Haiti

Damage Rating	Description	Concrete & Masonry System Interpretation	Wood Framed System Interpretation
No Damage Pa gen dega ditou	*No visible structural damage and either no or just slight non-structural damage*	No/slight evidence of cracking of infill/finishes	No/slight evidence of cracking of infill/finishes or dislodging of cover
Minor Damage Yon ti dega	*Slight structural damage and slight to moderate level of non-structural damage*	Surface damage (cracking of infill or stucco cover lost)	Minor loss of infill at top of wall or minor dislodging of wall cover
Moderate Damage Kèk Dega	*Moderate structural damage and moderate to severe level of non-structural damage*	Cracks in masonry walls but majority of vertical-load-carrying capacity retained	Loss of infill in select panels, minor racking of frame
Severe Damage Gwo dega	*Severe structural damage and moderate to severe level of non-structural damage*	Significant cracks in walls or columns compromising vertical carrying capacity, but alternate load paths available	Loss of infill in multiple panels, more significant racking without loss of stability or ability to support roof
Partial/Total Collapse Yon pati/ Tout kay la tonbe	*Severe structural damage and moderate to severe level of non-structural damage*	Collapse of full story or part of floorplan up to total collapse	Complete or partial collapse, framing no longer able to support roof

Volunteer engineers were assigned packets (collections of records) to review and enrich, using this guidance in their review of the photographic evidence and audio translations. They updated three sets of fields in the Fulcrum interface (see Fig. 4.2): (1) overall damage rating with any notes justifying their assignment, (2) building description inclusive of number of stories above ground and primary structural system, and (3) a quality control code flagging the completeness of the record (see Section 4.5). They might add additional notes to substantiate their damage rating or point out any notable features of the building or its performance such as the building name or year of construction as inferred from photos or the audio transcription. Note that typology and number of stories were typically not assigned for many collapsed buildings since it is nearly impossible to discern without pre-event imagery, which is not common in Haiti.

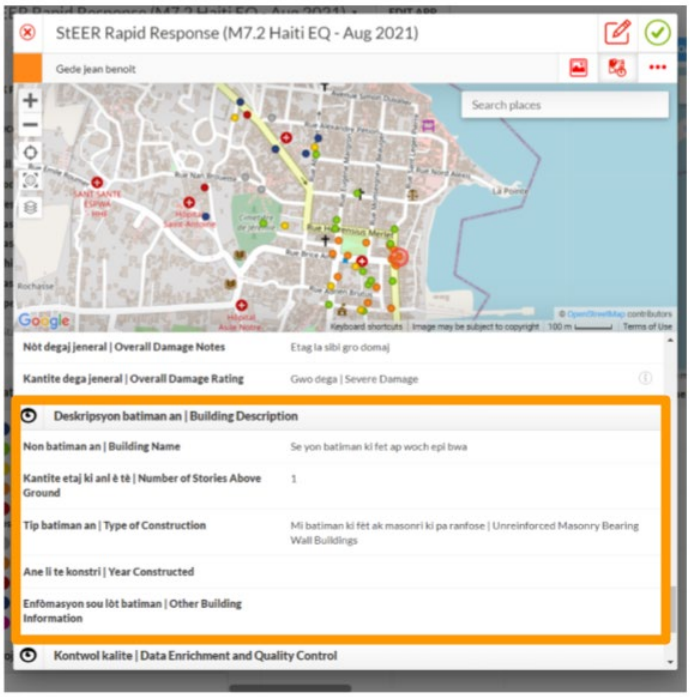


Fig. 4.2. Screen capture Fulcrum record editing interface showing the map view and box highlighting fields to be updated by expert assessors. Pressing the pencil logo in the upper right corner allows fields to be edited.

4.4 Enrichment by Student Engineers

Upon learning that official assessments conducted by UNOPS did not require professional engineers for the assessment of residential structures, the team scaled up its virtual assessment efforts to include Notre Dame engineering students trained in basic assessment techniques for Haitian housing, which constituted the largest cross-section of the data. Students were provided with a modified guidance set, similar to the resources in Section 4.3, but focused on residential construction. Students would reference these resources as they assigned the number of stories, the structural system (typology), and a damage rating on the 5-point EMS-98-compatible scale in Table 4.1 in accordance with the schema in Figure 4.1. They recorded the building name, if discernible from signage or audio transcription. Students also assigned a quality control code flagging the completeness of the record (see Section 4.5).

4.5 Data Enrichment and Quality Control Codes

A series of data enrichment and quality control (DE/QC) codes were assigned to the records. Code of 0 was used during the process to signal a record was lacking one or more of the required fields. Code of 1 labels records that were not assessed because the photo did not depict a building, but were maintained in the dataset for completeness since these could be of interest to some parties. These generally were streets or roads. Records coded as 3 are most reliable as they have both damage ratings as well as geolocation data, whereas records coded with variations of 2 use different approximate geocodes, as discussed in Section 4.1. Table 4.2 summarizes the number of records achieving each level of data enrichment and quality control.

Table 4.2. Percentage of records with each Data Enrichment and Quality Control code		
Stage	**Brief Description**	**Percentage of Records**
0	Damage rating not assigned, record not yet assessed or reviewed.	**0%**
1	Damage rating cannot be assigned (blank) since the documented structure/site condition is not a building. These are retained in the dataset for completeness.	**0.2%**
2a	Damage rating is assigned but actual geolocation data was low resolution due to poor satellite coverage; the low accuracy Created Location (reported by Fulcrum) is reported as the record coordinates.	**2.7%**
2b	Damage rating is assigned but actual geolocation data was unavailable due to GPS errors; in these cases proxy coordinates were assigned based on the community name, adopting a standard list of coordinates for each community.	**7.7%**
3	Damage rating is assigned with actual geolocation data.	**89.4%**

5.0 Archived Data Products

This section details the directory structure created in DesignSafe-CI and the contents therein. See Appendix E for the Data Model summarizing the structure and organization of the data.

🖿 Directory D0. Planning Documents

FORMAT = PDF

This folder contains the planning document used to guide the field data collection, including sampling strategy, chronology of data collection (targeted zones, routes), and resources used for training and coordination.

🖿 Directory D1. Performance Assessments

FORMATS = CSV, JPG, M4A

This directory contains four CSV files:

- **performance_assessment_data:** final enriched and quality-controlled dataset with all the response fields in Appendix A.
- **overview_photos_metadata:** these provide all available photo metadata for each overview photograph associated with each Performance Assessment record
- **detail_photos_metadata:** these provide all available photo metadata for each detail photograph associated with each Performance Assessment record

- audio_metadata: these provide all available audio recording metadata for each audio dictation appended to a Performance Assessment record

These CSVs are accompanied by **Images** and **Audio** folders that respectively contain each photo and audio recording associated with a specific record. Each image or audio recording is linked to its corresponding record by a unique alpha-numeric string. This unique string is both the filename of the image or recording file and also listed in the corresponding data field for that record in the CSV database.

Note that not all response fields in the CSV files will have values, for reasons described in Section 4.

🖿 Directory D2. Guidance Documents

FORMAT = PDF

This folder contains the following three guidance documents developed to guide remote assessors (see Section 4.3). Only the guidance provided to Remote Engineers is included in this directory since the Student Engineers' instructions are derived from this guidance:

- **Data Enrichment & Quality Control Handbook:** explains the remote assessment process to be conducted on each assigned record.
- **Assessment Guide:** Abbreviated guidance document summarizing the process of classifying structures based on Haitian construction norms and assigning damage ratings.
- **Assessment Manual:** Additional examples and explanations to assist in classifying construction types and damage in Haiti (referenced by the Assessment Guide).

6.0 Contacts

For inquiries on specific sets of data, please contact the following individuals:

Performance Assessments	**General Queries about Dataset**
Tracy Kijewski-Correa tkijewsk@nd.edu	Angelique Mbabazi angeliquembabazi321@gmail.com

7.0 References

Grünthal G. (1998) E*uropean Macroseismic Scale 1998 (EMS-98). Cahiers du Centre Européen de Géodynamique et de Séismologie 15,* Centre Européen de Géodynamique et de Séismologie: Luxembourg.

Kijewski-Correa, T., B. Alhawamdeh, C. Arteta, W. DJIMA, T. Do, S. Garcia, M. Gartner, S. Gunay, W. Hassan, S. Javadinasab Hormozabad, M. Marinkovic, A. Martin, Y. Merino, C. Pájaro Miranda, X. Romão, C. Burlotos, K. Mosalam, I. Robertson, J. Rodgers, A. Taflanidis, (2021) "StEER: M7.2 Nippes, Haiti Earthquake Preliminary Virtual Reconnaissance Report (PVRR)", in StEER - 14 August 2021, M7.2 Nippes Earthquake, Haiti. DesignSafe-CI. https://doi.org/10.17603/h7vg-5691

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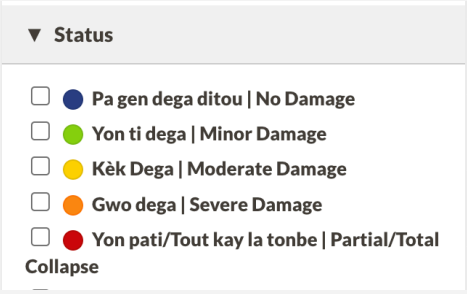
Appendix A. Fulcrum App Fields

Grey-shaded rows are completed automatically by Fulcrum, yellow-shaded rows by the field data collectors, green-shaded rows by the remote engineering assessors, and red-shaded rows by data librarians.

Field	Description	Format/Options	Percent Populated
_record_id	Unique identifier generated (part of Fulcrum metadata)	This field is available when data is downloaded outside of Fulcrum	100%
_title	Identifies the type of structure	This field is available when data is downloaded outside of Fulcrum	100%
created at	Time record was created on device (part of Fulcrum metadata)	This field is available when data is downloaded outside of Fulcrum	100%
updated at	Time record was updated (part of Fulcrum metadata)	This field is available when data is downloaded outside of Fulcrum	100%
created by	Registered user creating record (part of Fulcrum metadata)	This field is available when data is downloaded outside of Fulcrum	100%
updated by	Registered user updating record (part of Fulcrum metadata)	This field is available when data is downloaded outside of Fulcrum	100%
_server_created_at	Time record was synchronized to backend (part of Fulcrum metadata)	This field is available when data is downloaded outside of Fulcrum	100%
_server_updated_at	Time record was updated on backend (part of Fulcrum metadata)	This field is available when data is downloaded outside of Fulcrum	100%
version	Number of times record has been updated	This field is available when data is downloaded outside of Fulcrum	100%

status	Color codes are assigned based on damage rating (for map visualization; human evaluators assign these five color codes.	 Note these five are based on field observations.		100%
project	Name of project in Fulcrum backend	M7.2 Earthquake - Haiti - 14 Aug 2021		100%
assigned to	Field to track data librarians assigned to quality control record	[Text Field]		51.43%
latitude **longitude**	Coordinates of building pulled from device positioning	[Decimal value]		99.97%
geometry	Syntax for visualizing image, e.g., point with given coordinates	This field is available when data is downloaded outside of Fulcrum		100%
non kominote a | community name	Name of community as recorded by field data collector	[Text Field]		98.39%
non ri a | street name	Street name as recorded by field data collector	[Text Field]		97.12%
strikti yo itilize | structure use	Use assigned by field data collector	Kay lopital/klinik Lekòl Legliz Komès/Biznis Sant kominotè Leta/Gouvènman Lòt	House Hospital/Clinic School Church Business Community Center Government Other	100%
apsi sou foto yo | overview photos	Photos of sides of building accessible to field data collector	Images		99.58%

detay pou foto yo |detail photos	Photos at close distance of visible damage	Images		83.22%
odyo | audio	Optional audio from field data collector explaining site or building features	Audio file(s)		74.53%
non inspekt a | inspector name	Name of engineer completing the assessment (in Haiti or remotely)	[Text Field]		99.48%
afilyasyon | affiliation	Affiliation of engineer completing the assessment (in Haiti or remotely)	[Text Field]		90.21%
dat | date	Date that engineer completed the assessment (in Haiti or remotely)	[Month, Day, Year]		99.992%
nt degaj jeneral | overall damage notes	Optional notes supplied by engineer completing the assessment (in Haiti or remotely)	[Text Field]		49.0%
overall damage rating	Assignment of damage on 5-point scale	Pa gen dega ditou Yon ti dega Kèk Dega Gwo dega Yon pati/Tout kay la tonbe	No Damage Minor Damage Moderate Damage Severe Damage Partial/Total Collapse	99.84%
non batiman an | building name	Building name, if known	[Text Field]		17.95%
Konben etaj ki anlè tè | number of stories above ground	Number of stories above grade	[Integer value]		83.31%
tip batiman an | type of construction	Structural system employed	Mi kay osinon batiman ki fèt ak masonri ki pa ranfòse	Unreinforced Masonry Bearing Wall Buildings	90.72%

		Mi kay osinon batiman ki fèt ak masonri ki ranfòse Masonri konfinen/fèmen ki fe kay la osinon batiman an Ankadreman beton ki ranpli ak masonri nan mi yo Ankadreman lejè nan bwa Bwa ak wòch nan mi Pa konnen Lòt	Reinforced Masonry Bearing Wall Buildings Confined Masonry Building Concrete Frames with Infill Masonry Shear Walls Wood light frames Wood with stone infill Unknown Other	
ane li te konstri | year constructed	Year constructed, if known	[4-digit year]		14.63%
enfmasyon sou lt batiman | other building information	Optional information about the building, including system type if “Other”	[Text Field]		15.23%
tcla_detection	Identifies if the building is a TCLA	0 1		100%
quality	States if the record can be assessed based on the quality of its photos	Poor quality Sufficient quality		62.29%
qualifications	States if the assessor is qualified to assess the record	Not qualified Qualified		58.93%
data sources	Optional list of other data sources consulted by engineer when completing the assessment (in Haiti or remotely)	[Text Field]		0.46%
done edit | data librarians	Name of data librarian	[Text Field]		0.56%

	conducting quality control review		
Utility score	Identifies the utility of a record based upon number of overview photos and geolocation accuracy	0 1 2 3 4 5	85.44%
etap | DEQC Stage	Level of enrichment or quality control received (fixed scale)	0 1 2 3	100%
not | DEQC notes	Additional comments by data librarian or assessor regarding uncertainties or QC issues	[Text Field]	16.52%
tradiksyon odyo | Audio translation	Translation of audio recording into English	[Text Field]	29.77%

Appendix B. Detailed Data Collection Chronology

Appendix B.1 Grand Anse Department		
Date	**Commune**	**Localities**
Monday, September 20, 2021	Zonn Salyé	
Tuesday, September 21, 2021	Zonn Previle	
Wednesday, September 22, 2021	Zonn Voldwog	
Thursday, September 23, 2021	Zonn Latibolye	
Friday, September 24, 2021	Zonn Leyon	
Saturday, September 25, 2021	Zonn Merode	
Monday, September 27, 2021	Prepare for training (no work by team)	
Tuesday, September 28, 2021	Training & practice	
Wednesday, September 29, 2021	Jeremie	City of Jeremie
Thursday, September 30, 2021	Jeremie	City of Jeremie
Friday, October 1, 2021	Jeremie	City of Jeremie
Saturday, October 2, 2021	Jeremie	City of Jeremie
Monday, October 4, 2021	Pestel	Town of Pestel Kafou Citron, Grand Chemin, Seguin, Nan Cherisier, Ka Gousse
		Special assignment for Gede
Tuesday, October 5, 2021	Pestel	Mabile, Dozeyid,Bernard, Toma, nan kepi, Bernard Gousse
Wednesday, October 6, 2021	Pestel	Nan Kasou, Lizonet, Nan Fig, Machil, Bernard Gousse
Thursday, October 7, 2021	Pestel	Derye kay, Nan moulen, nan fenan, Nelson, ka savon, Lamanten Zabriko
Friday, October 8, 2021	Pestel	Madan Don, Nan Etyen
Monday, October 11, 2021	Corail	Town of Corail Rue Amiral kilik, Rue Pere benier, rue Mitan, rue Raphaelle Galety, Cite Beda, rue fonfevrie, Rue pere

		Cavemite, Lasource, Cite Balarou, La chaucher
Tuesday, October 12, 2021	Corail	1) petite- plaine 2) Nan venfò 3) lakonb 4) Kanpèch 5) pate-Large 6) Anba Bodmè 7) Boukan Nwel
Wednesday, October 13, 2021	Corail	1) fratenite 2) tè blanch 3) Dikiyon 4) Roch myél 5) Nan jak 6) Tet Lakonb 7) Nan valse
Thursday, October 14, 2021	Beaumont (Bomon)	1) sen anyès 2) nan kafe 3) nan andre 4) sesilya
Friday, October 15, 2021	Beaumont (Bomon)	1) nan gine 2) kasanèt 3) rue louis jean 4) rue Macandal 5) Rout nasyonal 6) gran ri
Monday, October 18, 2021	Mafran (Marfranc)	1) Pakafou 2) Derye kakaro 3) kap a fou 4) Nan Boubez 5) Mònn mennò 6) Lan Meri 7) Sou Fò
Tuesday, October 19, 2021	Mafran (Marfranc)	1) Madan divenston 2) Derye teren 3) sant vil mafran 4) Ri jean claude 5) Nan ti woch
Wednesday, October 20, 2021	Mafran (Marfranc)	1) nan fondlyn 2) Rue jean claude prolonge 3) Bokalen 4) Lan Derain 5) deryè Bannann

Thursday, October 21, 2021	Moron	1) kafou 49 2) rue toussaint louverture 3) rue marie charle antoine
Friday, October 22, 2021	Moron	1) Kadèt 2) Roch kodas 3) Rue Fernand jesmar 4) Rue Albert saintdou 5) Tou Loulou
Monday, October 25, 2021		1) gebo 2) chato 3) kafou obak 4) kafou diri 5) st yves
Tuesday, October 26, 2021		localities in Rozo 1) sant vil la 2) ri antèman 3) Nan Nivre 4) rout nasyonal #7 Localities in Jeremie 1) foukan 2) Latibolye 3) Mòn bomon 4) Vètigo 5) Ranja
Wednesday, October 27, 2021		Localities in Rozo 1) Nan vilaj 2) wout Nasyonal #7 3) Nan Gomye Localities in Jeremie: Rue Sasye Diranton Mòvan Masèl Brijit Mòn Ginode Klèjo Piram
Thursday, October 28, 2021		Localities in Jeremie 1) Nan lendi 2) wout èpot jeremi 3) zon nimero 2 4) kamanyol

Friday, October 29, 2021		Localities in Jeremie: 1) premye sous 2) Voldrog 3) kanon 4) sent anyès 5) Sen maten 6) Kafou maka
Monday, October 25, 2021	Pestel	Section: Espère 1) abriko 2) Lisyè 3) Rozè 4) Sannit 5) Feryè 6) Kafou chodyè
Tuesday, October 26, 2021		Section: Jean-Bellune 1) Nan boko 2) Javèl 3) Mamèya 4) Jan belinn 5) Nan sikren 6) Jemipèch 7) Belizè
Wednesday, October 27, 2021		Section: Tozia 1) Pomoz 2) Tozia 3) Lasous 4) Gojèt
Thursday, October 28, 2021	Pestel	Section: Duchity (Day 1) 1) Pyevil 2) Flèvè 3) Dichity
Friday, October 29, 2021	Pestel	Section: Duchity (Day 2) 1) Derrière chapèl 2) source 3) nan kaboule 4) fevrine 5) zabricot

Appendix B.2 Sud Department		
Date	**Commune**	**Locality/Section**
Monday, September 20, 2021	Training new team members in use	Les Cayes

	of Fulcrum; practice Housing Surveys	
Tuesday, September 21, 2021	Training team in Did You Feel It? survey; practice Priority Building Surveys	Les Cayes
Wednesday, September 22, 2021	Cavaillon	Cavaillon (Town) Girodier
Thursday, September 23, 2021	Cavaillon	Bedo (2) Grandier (2) Felix (1)
Friday, September 24, 2021	Cavaillon	Grand Place (1) Boileau (1) Berard (1) Martino (1) Chemin (1)
Monday, September 27, 2021	Maniche	Work in the most populated localities *Note: Team already collected records in Village of Maniche*
Tuesday, September 28, 2021	Maniche	Work in the most populated localities *Note: Team already collected records in Village of Maniche*
	Cavaillon	Village of Labiche
	Cavaillon	Village of Bonne Fin
Wednesday, September 29, 2021	Camp-Perrin	Champlois - Marceline *Note: Team already collected records in Marceline*
Thursday, September 30, 2021	Camp-Perrin	Lévy - Mersan
Friday, October 1, 2021	Camp-Perrin	Tibi - Davezac
Tuesday, October 5, 2021	St. Louis du Sud	Seismic Station Survey
Wednesday, October 6, 2021	St. Louis du Sud	City of St. Louis du Sud, Other localities in St. Louis du Sud Commune

Thursday, October 7, 2021	Aquin	City of Aquin, Other localities in Aquin Commune
Friday, October 8, 2021	Aquin	Other localities in the commune
Saturday, October 9, 2021	Maniche	Geffrard
	Torbeck	Beraud, Mersan
	Torbeck	Ducis
Monday, October 11, 2021 [6 person-days]	St. Louis du Sud	Seismic Station Survey (Return Visit I)
Tuesday, October 12, 2021 [6 person-days]	St. Louis du Sud	Seismic Station Survey (Return Visit II)
Wednesday, October 13, 2021 [6 person-days]	Camp-Perrin (one team of two)	Town of Camp Perrin
	Cavaillon	Bonne Fin
	Maniche	Dory

Appendix B.3 Nippes Department		
Date	**Sub-team**	**Community or Communal Section**
Wednesday, September 22,2021	Anse-à-Veau	Baconnois
	Arnaud	Baquet
	Baradères	Gérin
	Fond des Nègres	Duverger
	Grand Boucan	Grand Boucan
	L'Asile	Changeux
	Miragôane	Berquin

	Plaisance	Vassale
	Petit trou de Nippes	Lièvre
Thursday, September 23, 2021	Team Anse a veau	Rocher Laval
	Team Arnaud	Grande Savane
	Team Baraderes	Centre ville
	Team Grand Boucan	Breyard
	Team Fond des Negres	Duverger
	Team Miragoane	Centre Ville
	Team Petit trou	Lièvre-Roseaux
	Team Plaisance	Vassale
Friday, September 24, 2021	Anse a veau	Brossard
	Arnaud	Morcou
	Baraderes	Fond Palmiste
	Grand Boucan	Les Basses
	Fond des Negres	Bouzi
	Miragoane	Fond Jean Simon
	Petit trou	St therese
	Plaisance	Brody
Saturday, September 25, 202	Anse a veau, Arnaud, Baraderes, Miragoane,	Perrien, Nougues, Riviere salee, Bellevue-Centre ville, Brody,Grande

	grand Boucan, L'Azile, Plaisance, Petit trou de Nippes	Ravine
Monday, September 27, 2021	Priority Commune	
Tuesday, September 28, 2021	Priority commune	
Wednesday, September 29, 2021		
Thursday, September	Survey in priority commune + Petite Riviere	Petite Riviere Anse a veau Plaisance Miragoane L'Azil Petit trou de Nippes
Friday, October 1, 2021		Petite Riviere Anse a veau Plaisance Miragoane L'Azil Baradères Petit trou
Saturday, October 2, 2021		All targeted cities

Appendix C. Default Community Coordinates

French Name	Creole Name	Latitude	Longitude
Bonbon	Bonbon	18.666396	-74.246098
Abricots	Abriko	18.633333	-74.3
Anse-D'Hainault	Ansdeno (Ans Deno)	18.5	-74.45
Beaumont	Creole: Bomon	18.483333	-73.966667
Chanbellan	Creole: Chanbèlan	18.566667	-74.316667
Dame Marie	Creole: Dam/Dann Mari	18.566667	-74.416667
Lèziwa	Lèziwa	18.6486979	-74.1143648
Jeremie	Jeremie (Jeremi)	18.638970	-74.118123
Petit-Trou-de-Nippes	Petit trou	18.533333	-73.516667
Plaisance-du-Sud	Plezans disid	18.433333	-73.616667
Arnaud	Arno	18.45	-73.383333
Baquet	Baquet	18.42521	-73.33836
Petite Rivière de Nippes	Petite Rivière de Nippes	18.483333	-73.25
Sault du Baril	Sault du baril	18.47	-73.28
Javel	Javel	18.419	-73.284
Anse-a-veau	Anse-a-veau	18.516667	-73.35
Mafran	Mafran (part of Cavaillon)	18.298927	-73.653437
Baraderes	Baraderes	18.4825	-73.638611
Boucan	Boucan	18.389819	-73.534783
Commune: Petit trou de Nippes Locality: Grande Ravine (Mirann)	Commune: Petit trou de Nippes Locality: Grande Ravine (Mirann)	18.533333	-73.516667
Vasal	Vasal	18.416051	-73.497750
Aux basses	Aux basses	18.573394	-73.710961

Zetroit	Zetroit (Etroit)	18.567	-73.717
Granzans	Granzans (Locality in Commune of Grand Boucan)	18.572767,	-73.652944
Commune: Fonds des nègres (Use for the Localities of Didier, Bidouze)	Commune: Fonds des nègres Use for the Localities of Didier, Bidouze	18.35	-73.233333
Nan jeanty	Nan jeanty	18.392195	-73.479669
L'Asile	Lazil	18.383333	-73.416667
Pestel	Pestel	18.533333	-73.8
Locality: Breya located in Commune: Grand Boucan (use Grand Boucan coordinates)	Locality: Breya located in Commune: Grand Boucan (use Grand Boucan coordinates)	18.55	-73.6
Aux Cayes	Aux Cayes | Les Cayes	18.2	-73.75
Corail	Koray	18.5675	-73.889444
Moron	Moron	18.560023	-74.257863
Iles Cayemite (Grande Cayemite)	Zile Kayimit	18.616667	-73.75
Roseaux	Rozo	18.6	-74.016667
Baquer	Baquer	18.426589	-73.337692
Marfranc	Mafran	18.585278	-74.211944

Appendix D. Translation Rates by Occupancy

Structure Use	Counts	Audio Translation	% of translated
Kay | House	7199	1490	20.70%
Lopital/klinik | Hospital/clinic	94	93	98.94%
Lekòl | School	829	828	99.88%
Legliz | Church	653	653	100.00%
Biznis | Business	383	383	100.00%
Sant kominotè | Community Center	44	44	100.00%
Gouvènman | Government	117	117	100.00%
Lòt | Other	47	47	100.00%
Total	**9366**	**3655**	**39.02%**

Appendix E. Data Model

2021 Nippes, Haiti Earthquake					Event Date	DD	MM	YYYY
DOCUMENT CLASSES								
Planning Documents	☑		N		Daily Summaries	☐		
Planning Documents	D	0	1					
Data Collection Plan			1		None			
					None			
Guidance Documents	☑		N		None			
Guidance Documents	D	2	3					
None	D							
None	D							
None	D							
DATA CLASSES								
Performance Assessments	☑		N		Surface-Level Panoramas	☐		
Performance Assessments	D	1	12560				0	
None	D				None			
None	D				None			
					None			
					None			
Unmanned Aerial Systems	☐				Terrestrial Scanning Technologies	☐		
		0					0	
None					None			
None					None			
None					None			
Hazard Characterization	☐				Other Ground-Based Observations	☐		
		0					0	
None					None			
None					None			
None								
					Positioning Data	☐		
							0	
					None			
					None			