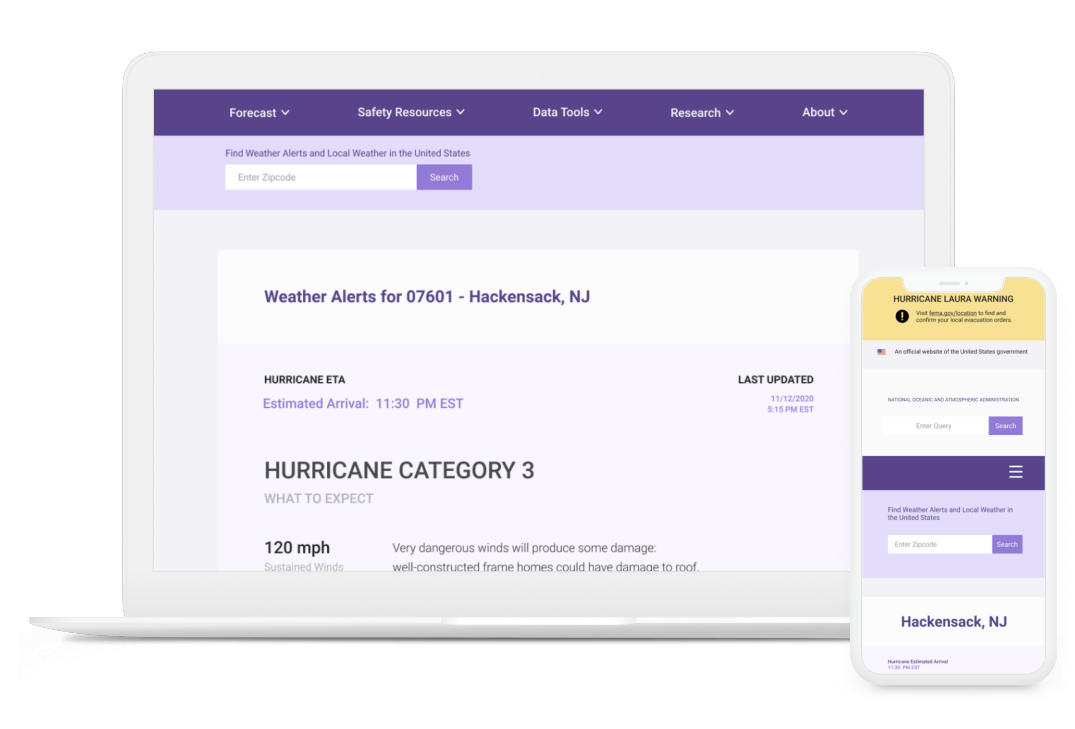

Forecast
Safety Resources
Data Tools
Research
About
Weather Alerts for 07601 - Hackensack, NJ
HURRICANE CATEGORY 3
120 mph
HURRICANE LAURA WARNING
Hackensack, NJ

Risk Communication Design

**Columbia University &
National Hurricane Center**

Roles
UX Design
UX Research
UI Design

Tools
Figma
Hotjar
Otter.ai
Usertesting.com

DISCOVERY

BACKGROUND

While working on my thesis, my advisor, Professor Robert Soden (http://robertsoden.io/) recruited me as a researcher where I collaborated with a team of sociologists, product designers, and computer scientists between Columbia University, University of Washington: Seattle, and University of Colorado: Boulder to assess a website redesign for the National Hurricane Center.

As a result, we presented 18 design opportunities to the National Hurricane Center, and one of the opportunities they picked is designing for user localization, which is the focus of my thesis, “Exploring User Localization as a Design Opportunity through Human-Centered Design Principles for the National Hurricane Center Home Page (NHC.NOAA.GOV).”

RESEARCH GOALS

- In a state of emergency during a hurricane, how do we provide users information relevant to their situation?
- Which information is important to display in order for them to make the best decision that would ethically suit their needs?
- What do users look for when assessing the risk of a hurricane?

INTERVIEWS

35 interviews were conducted remotely through Zoom. There are three categories of questions that we used: demographics, past experiences with disasters, and post concerns. We interviewed participants across the United States that were in locations susceptible to hurricane disasters. The initial part of the process focuses on the demographics and background, mostly asking how long they have lived in their current residency, or if they have any prior training related to disasters or severe weather.

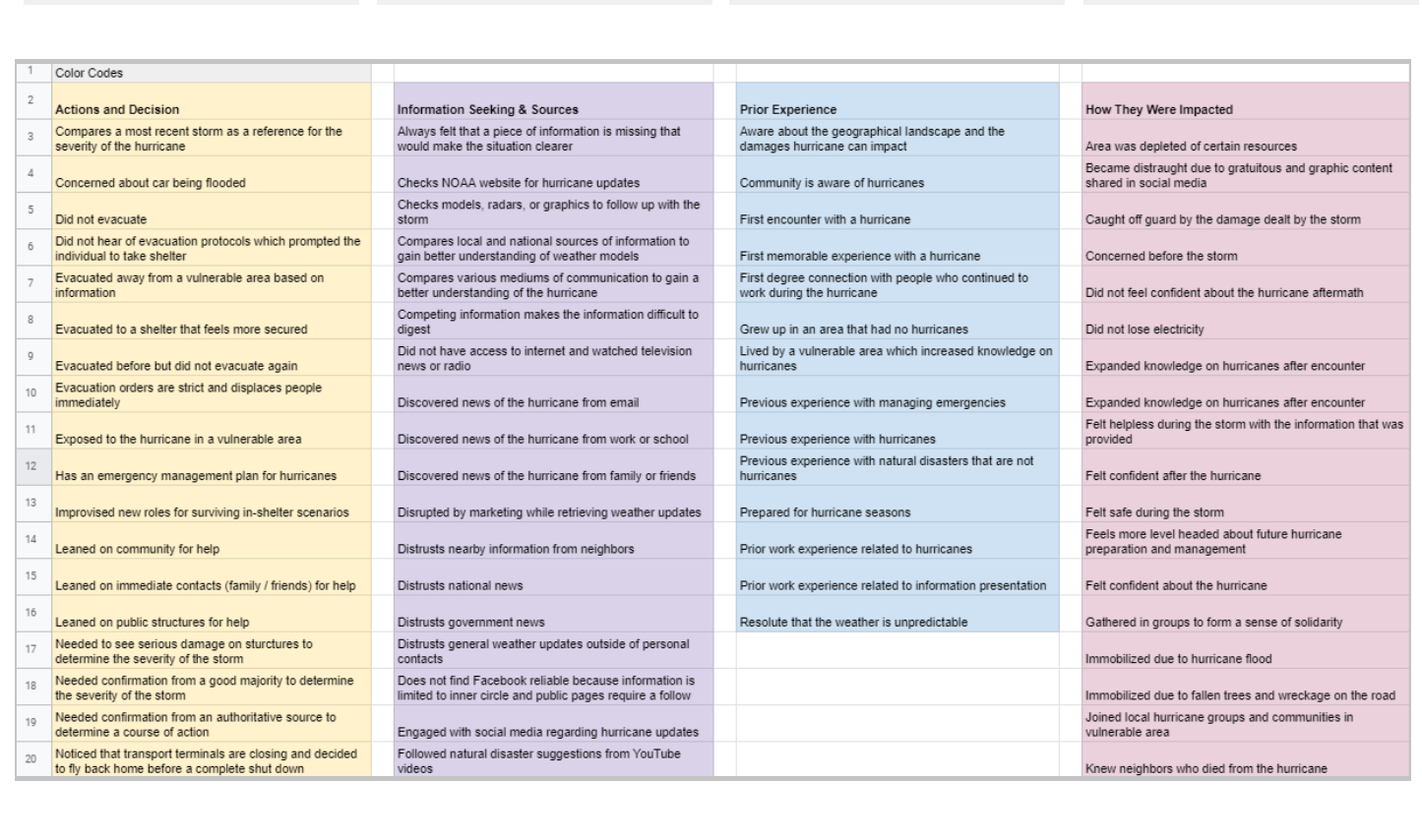
These questions generally assess for experience and familiarity of users to hurricanes which would help in constructing the display of the home page. The next set of questions aimed at how they were able to retrieve hurricane information, and the actions that they have taken based on the lack of or known information. 4 themes were generated from the inteviews, and 166 codes were collected. Afterwards, the theme I focused on is information seeking and sources.

35 PARTICIPANTS

4 THEMES

166 TOTAL CODES

82 CODES ON INFOMRATION SEEKING SOURCES



1	Color Codes			
2	**Actions and Decision**	**Information Seeking & Sources**	**Prior Experience**	**How They Were Impacted**
3	Compares a most recent storm as a reference for the severity of the hurricane	Always felt that a piece of information is missing that would make the situation clearer	Aware about the geographical landscape and the damages hurricane can impact	Area was depleted of certain resources
4	Concerned about car being flooded	Checks NOAA website for hurricane updates	Community is aware of hurricanes	Became distraught due to gratuitous and graphic content shared in social media
5	Did not evacuate	Checks models, radars, or graphics to follow up with the storm	First encounter with a hurricane	Caught off guard by the damage dealt by the storm
6	Did not hear of evacuation protocols which prompted the individual to take shelter	Compares local and national sources of information to gain better understanding of weather models	First memorable experience with a hurricane	Concerned before the storm
7	Evacuated away from a vulnerable area based on information	Compares various mediums of communication to gain a better understanding of the hurricane	First degree connection with people who continued to work during the hurricane	Did not feel confident about the hurricane aftermath
8	Evacuated to a shelter that feels more secured	Competing information makes the information difficult to digest	Grew up in an area that had no hurricanes	Did not lose electricity
9	Evacuated before but did not evacuate again	Did not have access to internet and watched television news or radio	Lived by a vulnerable area which increased knowledge on hurricanes	Expanded knowledge on hurricanes after encounter
10	Evacuation orders are strict and displaces people immediately	Discovered news of the hurricane from email	Previous experience with managing emergencies	Expanded knowledge on hurricanes after encounter
11	Exposed to the hurricane in a vulnerable area	Discovered news of the hurricane from work or school	Previous experience with hurricanes	Felt helpless during the storm with the information that was provided
12	Has an emergency management plan for hurricanes	Discovered news of the hurricane from family or friends	Previous experience with natural disasters that are not hurricanes	Felt confident after the hurricane
13	Improvised new roles for surviving in-shelter scenarios	Disrupted by marketing while retrieving weather updates	Prepared for hurricane seasons	Felt safe during the storm
14	Leaned on community for help	Distrusts nearby information from neighbors	Prior work experience related to hurricanes	Feels more level headed about future hurricane preparation and management
15	Leaned on immediate contacts (family / friends) for help	Distrusts national news	Prior work experience related to information presentation	Felt confident about the hurricane
16	Leaned on public structures for help	Distrusts government news	Resolute that the weather is unpredictable	Gathered in groups to form a sense of solidarity
17	Needed to see serious damage on sturctures to determine the severity of the storm	Distrusts general weather updates outside of personal contacts		Immobilized due to hurricane flood
18	Needed confirmation from a good majority to determine the severity of the storm	Does not find Facebook reliable because information is limited to inner circle and public pages require a follow		Immobilized due to fallen trees and wreckage on the road
19	Needed confirmation from an authoritative source to determine a course of action	Engaged with social media regarding hurricane updates		Joined local hurricane groups and communities in vulnerable area
20	Noticed that transport terminals are closing and decided to fly back home before a complete shut down	Followed natural disaster suggestions from YouTube videos		Knew neighbors who died from the hurricane

COMPETITOR ANALYSIS

After all of the code reviews, 18 opportunities were presented to the National Hurricane Center. They provided their feedback and mentioned that they would like to see a design for user localization. From that point on, the first thing I did is conducted a competitor analysis to check how other applications are utilizing user localization on their home pages. Patterns started appearing, such as defaulting to user localization where the application would directly show the results without asking or a search input bar that asks for a zip code. Over 60 applications were audited for user localization.

Weather.com is interesting because this acts as two-fold: automatic and manual geolocation. The automatic geolocation is used on the front page, and since Weather.com relies on ads, they could take advantage of the automated geolocation to cater to a specific audience. The NHC could use this same technique, and on the front-page, it could automate the geolocation and check if the area has any upcoming hurricanes or alerts. Websites that sell products are often given the option to pick up an item via store, and the stores listed are based on proximity to the user’s location (retrieved via geolocation).

Competitors	Emergency Application	Defaults to User Localization	Uses Interactive Maps
NYC Notify	●		●
Google Weather		●	
NYC Hurricane	●	●	●
Uber		●	●
Weather.com	●		●
AccuWeather	●		●
Weather Underground	●	●	

DEFINE

USER PERSONAS

From the interviews, four user personas were created that reflects the codes pulled from the theme of “information seeking sources.” Sketches were created based on these four personas as well but for the user testing, one user persona was picked which is Chloe’s persona because the participants that were interviewed mainly reflects her character.

Maggie, 45 Years Old

You have experienced hurricanes before and followed procedures for evacuation. In your last experience, your next-door neighbor convinced you that the floods could potentially reach up to 9 ft.

Kyle, 18 Years Old

You’re an 18-year-old student from Iowa studying at NYU. This is your first semester. You’ve experienced tornadoes and weathered through a couple of storms, but never had contact with hurricanes.

Chloe, 26 Years Old

You’re a 26-year-old bartender that recently moved to Hackensack, New Jersey. You formerly lived in Harlem, NY. You have not experienced a hurricane but have experienced heavy rainstorms.

Desmond, 35 Years Old

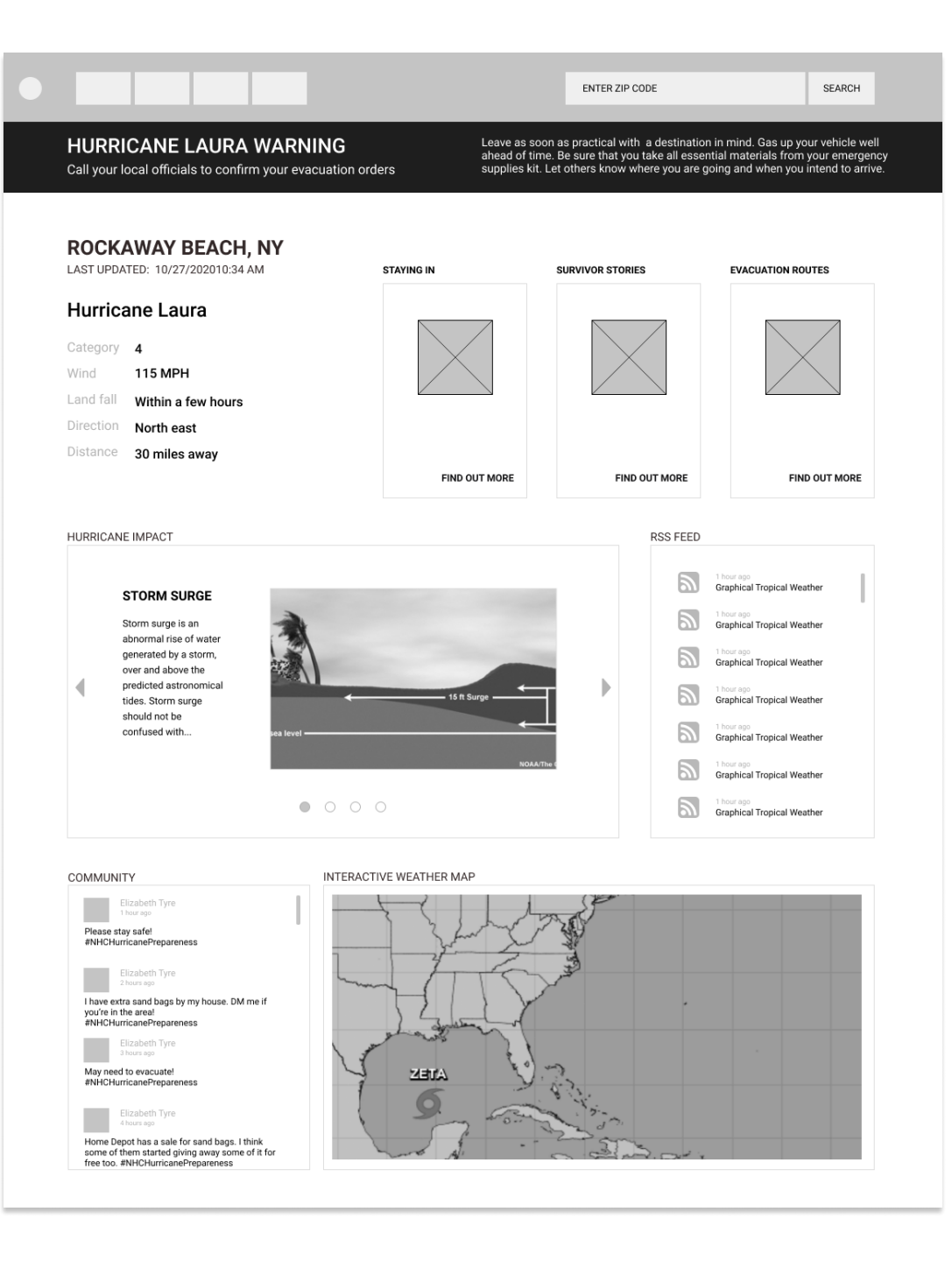
You are a 35-year-old nurse who works in Hackensack NJ. You are ready to clock out from your shift. You’ve been inside the hospital for almost twenty-four hours and have not stepped out.

SKETCHES

After all the research I have conducted, I started building low fidelity sketches on Figma for each persona. Not all personas share the same secondary needs, so I consolidated their primary needs into a final user interface. I combined the components that overlap for all personas, and removed the components that include social media because even though this was requested, the client also does not currently support this feature.

I also made component sketches that I further refined for the user persona sketches. They mainly consist of components relevant to hurricane risk information, such as a main search bar, interactive maps, notification sign-ups, and more. Some of the components did not make the cut because they were not as pertinent to the user persona. Those sketches can be viewed here.

User Persona: Maggie


ENTER ZIP CODE
SEARCH
HURRICANE LAURA WARNING
ROCKAWAY BEACH, NY
LAST UPDATED: 10/27/202010:34 AM
Hurricane Laura
Category 4
Wind 115 MPH
Land fall Within a few hours
Direction North east
Distance 30 miles away
STAYING IN
SURVIVOR STORIES
EVACUATION ROUTES
FIND OUT MORE
HURRICANE IMPACT
STORM SURGE
15 ft Surge
RSS FEED
Graphical Tropical Weather
COMMUNITY
Elizabeth Tyre
INTERACTIVE WEATHER MAP
ZETA

Call your local officials to confirm your evacuation orders

Leave as soon as practical with a destination in mind. Gas up your vehicle well ahead of time. Be sure that you take all essential materials from your emergency supplies kit. Let others know where you are going and when you intend to arrive.

Storm surge is an abnormal rise of water generated by a storm, over and above the predicted astronomical tides. Storm surge should not be confused with...

Please stay safe! #NHCHurricanePreparedness

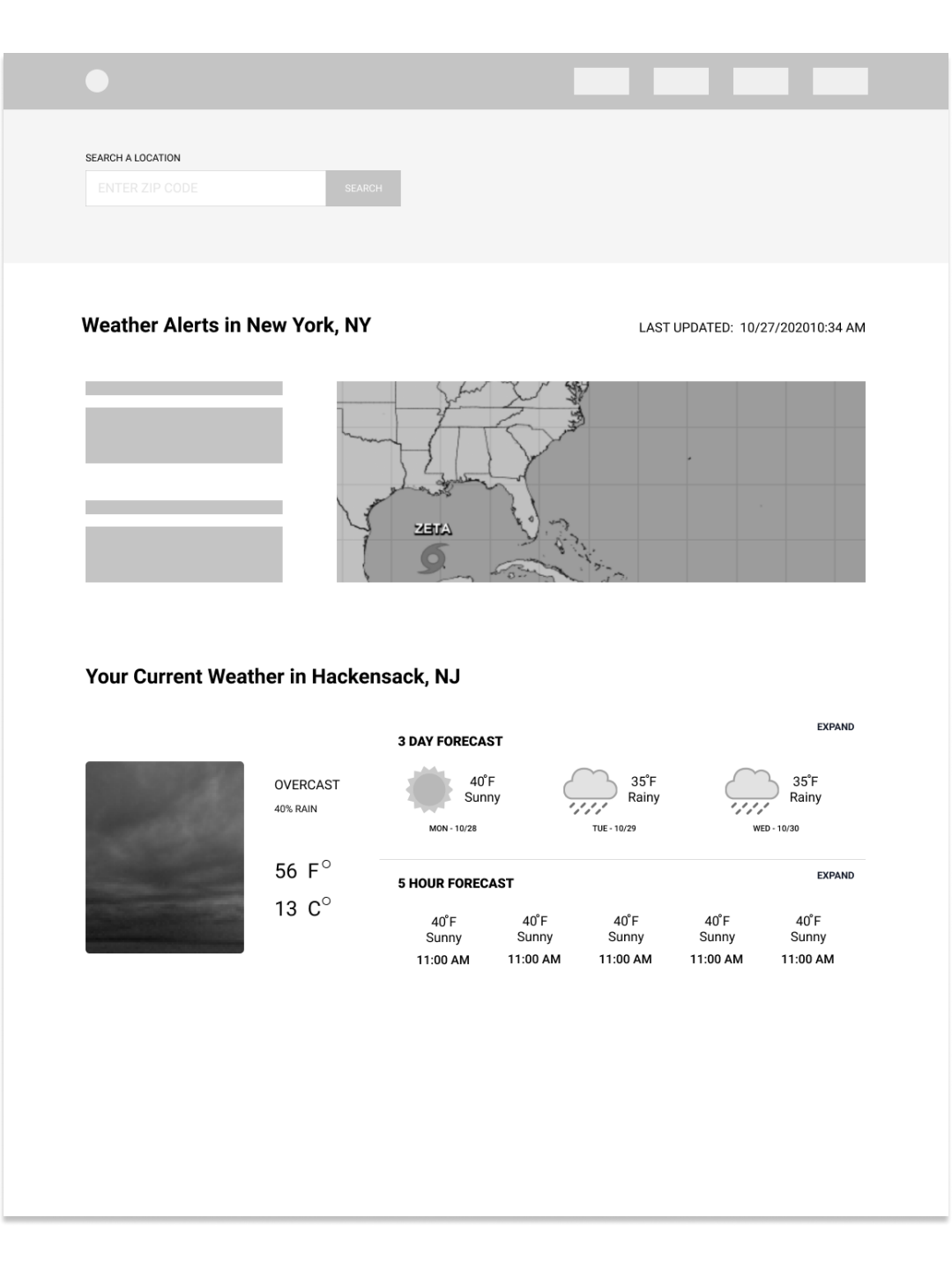
I have extra sand bags by my house. DM me if you're in the area! #NHCHurricanePreparedness

May need to evacuate! #NHCHurricanePreparedness

Home Depot has a sale for sand bags. I think some of them started giving away some of it for free too. #NHCHurricanePreparedness

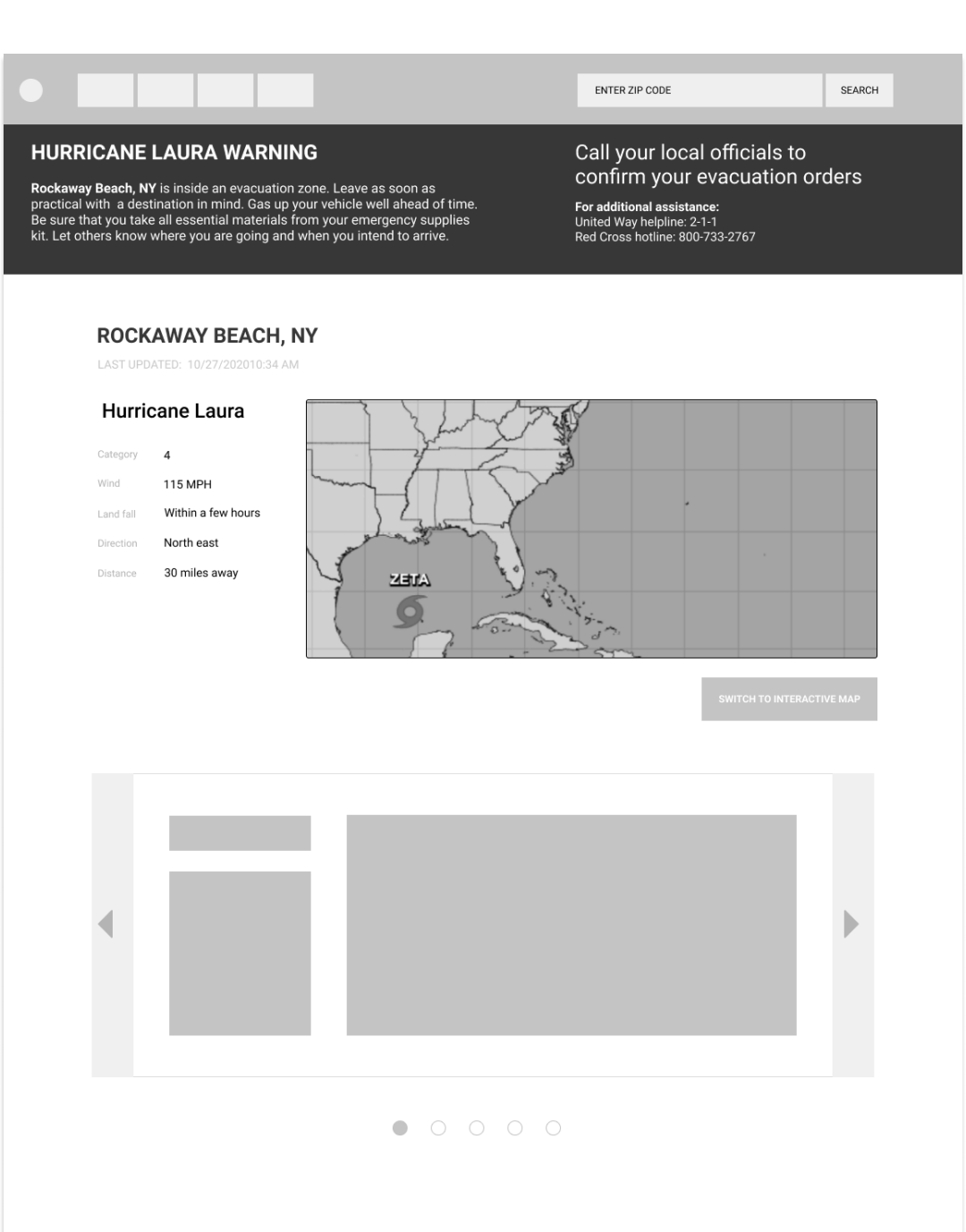
- Uses default user localization to show the immediate alerts and current weather within the area of the area.
- Provides a search bar that allows the user to check other locations.
- Has an area for an interactive map that follows a hurricane.
- Area to the left of the hurricane map contains pertinent hurricane information.
- Has a social media section to check for local updates.
- Contains a carousel showing various impacts of hurricane.

User Persona: Kyle


SEARCH A LOCATION
ENTER ZIP CODE
SEARCH
Weather Alerts in New York, NY
LAST UPDATED: 10/27/202010:34 AM
ZETA
Your Current Weather in Hackensack, NJ
3 DAY FORECAST
EXPAND
OVERCAST
40% RAIN
56 F
13 C
40°F Sunny MON - 10/28
35°F Rainy TUE - 10/29
35°F Rainy WED - 10/30
5 HOUR FORECAST
40°F Sunny 11:00 AM

- Uses default user localization to show the immediate alerts and current weather within the area of the area.
- Provides a search bar that allows the user to check other locations.
- Has an area for an interactive map that follows a hurricane.
- Area to the left of the hurricane map contains pertinent hurricane information.
- Shows when the information for the hurricane is last updated.

User Persona: Chloe


ENTER ZIP CODE
SEARCH
HURRICANE LAURA WARNING
ROCKAWAY BEACH, NY
Hurricane Laura
Category 4
Wind 115 MPH
Land fall Within a few hours
Direction North east
Distance 30 miles away
ZETA
SWITCH TO INTERACTIVE MAP

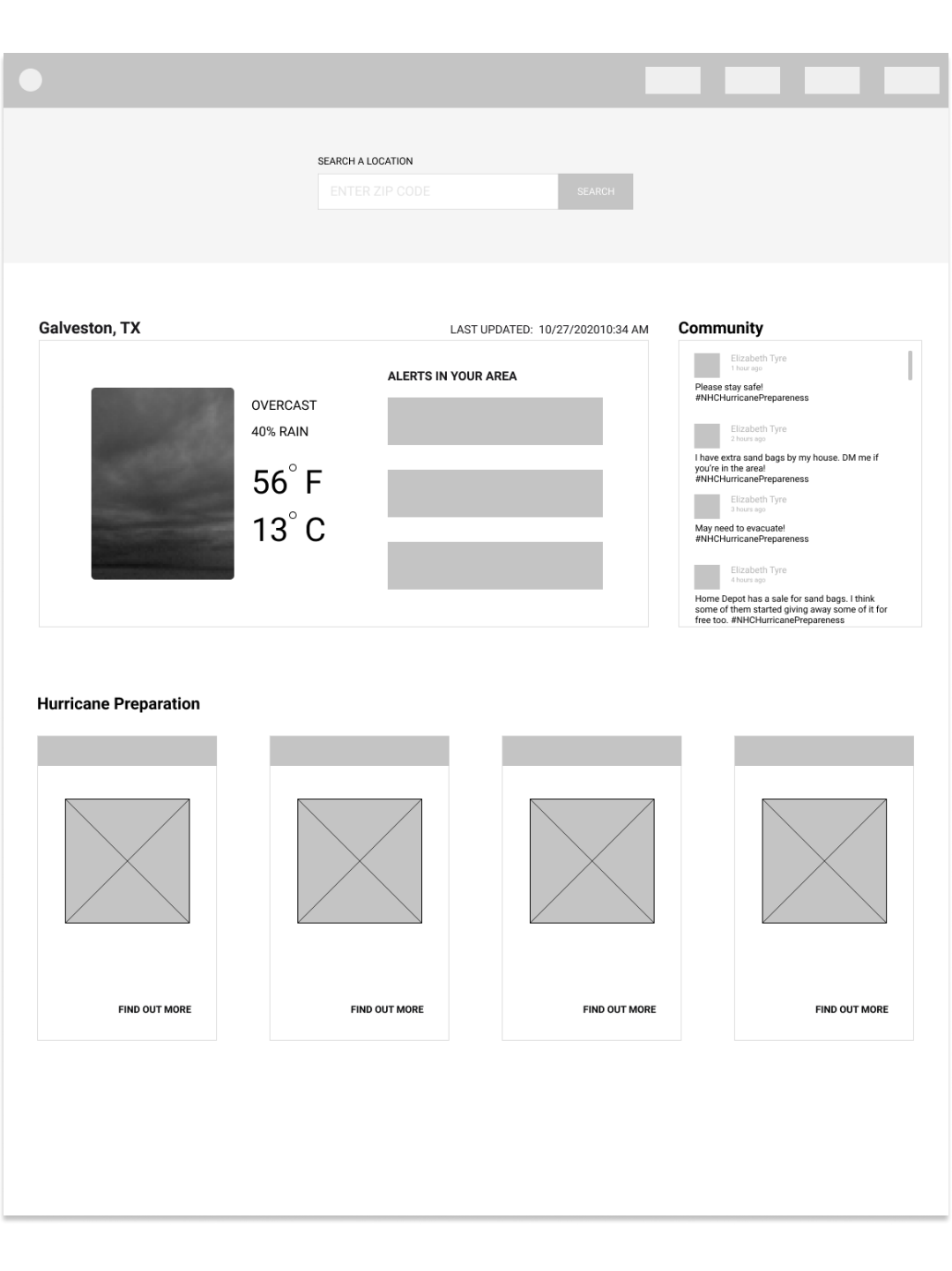
Rockaway Beach, NY is inside an evacuation zone. Leave as soon as practical with a destination in mind. Gas up your vehicle well ahead of time. Be sure that you take all essential materials from your emergency supplies kit. Let others know where you are going and when you intend to arrive.

Call your local officials to confirm your evacuation orders

For additional assistance:
United Way helpline: 2-1-1
Red Cross hotline: 800-733-2767

- Uses default user localization to show the immediate alerts and current weather within the area of the area.
- Provides a search bar that allows the user to check other locations.
- Has an area for an interactive map that follows a hurricane.
- Area to the left of the hurricane map contains pertinent hurricane information.
- Bottom carousel contains information for local weather and different hurricane impacts.

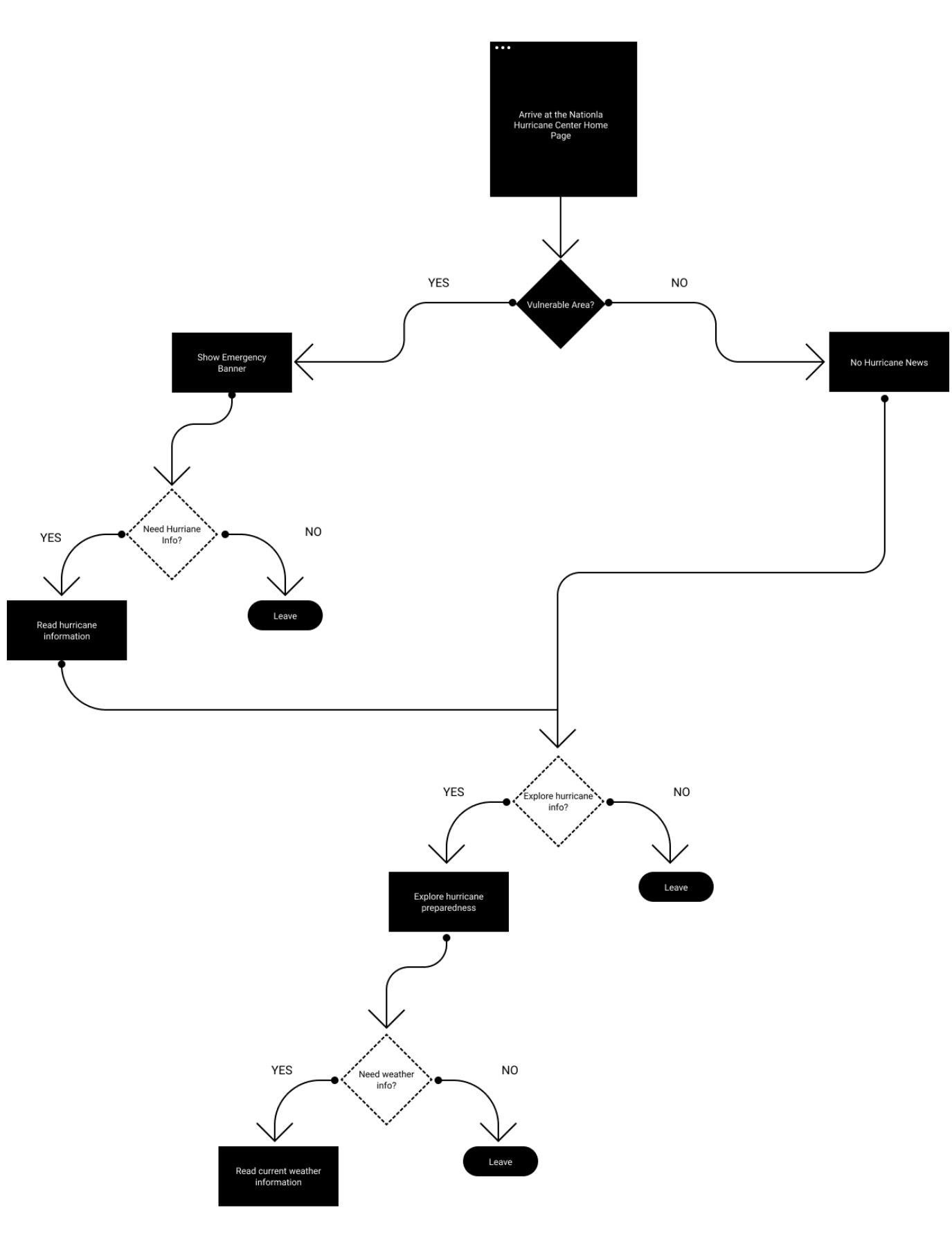
User Persona: Desmond


SEARCH A LOCATION
ENTER ZIP CODE
SEARCH
Galveston, TX
LAST UPDATED: 10/27/202010:34 AM
Community
OVERCAST
40% RAIN
56 F
13 C
ALERTS IN YOUR AREA
Hurricane Preparation
FIND OUT MORE

- Uses default user localization to show the immediate alerts and current weather within the area of the area.
- Provides a search bar that allows the user to check other locations.
- Contains local weather immediately and different alerts in the area.
- Shows different ways to prepare for hurricane below the weather alert.
- Has a social media component to check for community updates.

USER FLOW

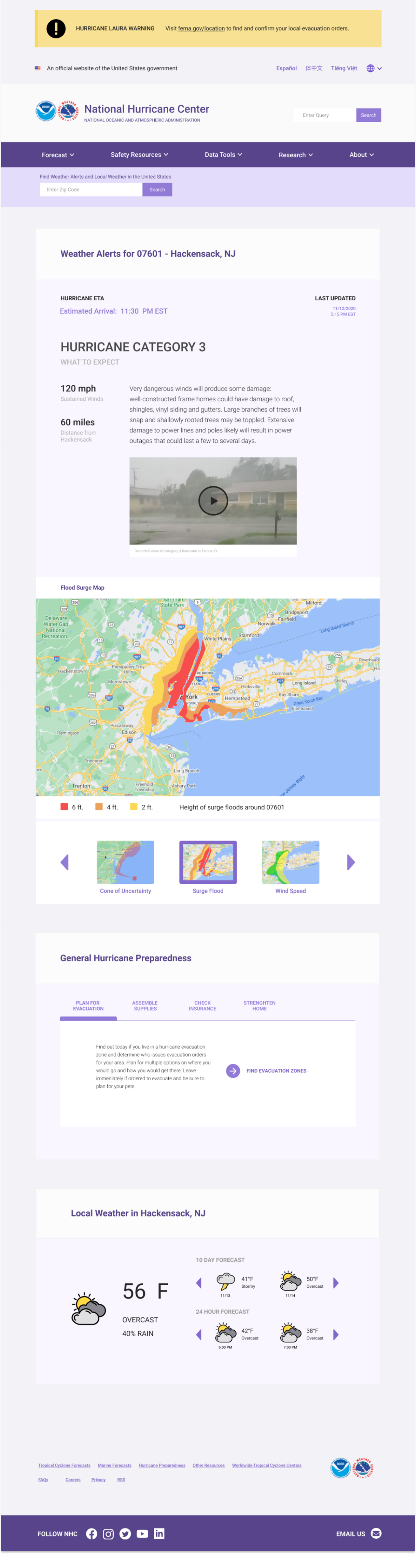
Since the focus is strictly on the home page, the user flow is limited to traversing the website based on whether the user needs hurricane or weather information. If the user is in a vulnerable area, the hurricane information immediately displays, otherwise that information will not be as available but the weather will be.


Arrive at the Nationla Hurricane Center Home Page
Vulnerable Area?
YES
NO
Show Emergency Banner
No Hurricane News
Need Hurriane Info?
YES
NO
Read hurricane information
Leave
Explore hurricane info?
YES
NO
Explore hurricane preparedness
Leave
Need weather info?
YES
NO
Read current weather information
Leave

DESIGN

FINAL DESIGN

The final design was tested with needs similar to the persona of Chloe. Most of the response from the final design consisted of adding social media which was present in the initial rough draft. I think that would be helpful in seeing how nearby users via social media are interacting with the storm.


HURRICANE LAURA WARNING
Español
体中文
Tiếng Việt
National Hurricane Center
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
Enter Query
Search
Forecast
Safety Resources
Data Tools
Research
About
Enter Zip Code
Search
Flood Surge Map
6 ft.
4 ft.
2 ft.
Cone of Uncertainty
Surge Flood
Wind Speed
PLAN FOR EVACUATION
ASSEMBLE SUPPLIES
CHECK INSURANCE
STRENGHTEN HOME
FIND EVACUATION ZONES
10 DAY FORECAST
41°F Stormy 11/13
50°F Overcast 11/14
24 HOUR FORECAST
42°F Overcast 6:00 PM
38°F Overcast 7:00 PM
Tropical Cyclone Forecasts
Marine Forecasts
Hurricane Preparedness
Other Resources
Worldwide Tropical Cyclone Centers
FAQs
Careers
Privacy
RSS
FOLLOW NHC
EMAIL US

Visit fema.gov/location to find and confirm your local evacuation orders.

An official website of the United States government

Find Weather Alerts and Local Weather in the United States

Weather Alerts for 07601 - Hackensack, NJ

HURRICANE ETA
Estimated Arrival: 11:30 PM EST

LAST UPDATED
11/12/2020
5:15 PM EST

HURRICANE CATEGORY 3
WHAT TO EXPECT

120 mph
Sustained Winds

60 miles
Distance from Hackensack

Very dangerous winds will produce some damage: well-constructed frame homes could have damage to roof, shingles, vinyl siding and gutters. Large branches of trees will snap and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.

Recorded video of category 3 hurricane in Tampa, FL

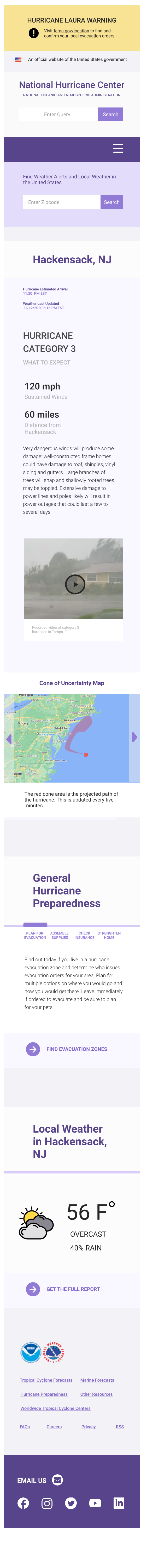
Height of surge floods around 07601

General Hurricane Preparedness

Find out today if you live in a hurricane evacuation zone and determine who issues evacuation orders for your area. Plan for multiple options on where you would go and how you would get there. Leave immediately if ordered to evacuate and be sure to plan for your pets.

Local Weather in Hackensack, NJ

56 F
OVERCAST
40% RAIN


HURRICANE LAURA WARNING
National Hurricane Center
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
Enter Query
Search
Enter Zipcode
Search
Cone of Uncertainty Map
PLAN FOR EVACUATION
ASSEMBLE SUPPLIES
CHECK INSURANCE
STRENGHTEN HOME
FIND EVACUATION ZONES
GET THE FULL REPORT
Tropical Cyclone Forecasts
Marine Forecasts
Hurricane Preparedness
Other Resources
Worldwide Tropical Cyclone Centers
FAQs
Careers
Privacy
RSS
EMAIL US

Visit fema.gov/location to find and confirm your local evacuation orders.

An official website of the United States government

Find Weather Alerts and Local Weather in the United States

Hackensack, NJ

Hurricane Estimated Arrival
11:30 PM EST

Weather Last Updated
11/12/2020 5:15 PM EST

HURRICANE CATEGORY 3
WHAT TO EXPECT

120 mph
Sustained Winds

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Recorded video of category 3 hurricane in Tampa, FL

The red cone area is the projected path of the hurricane. This is updated every five minutes.

General Hurricane Preparedness

Find out today if you live in a hurricane evacuation zone and determine who issues evacuation orders for your area. Plan for multiple options on where you would go and how you would get there. Leave immediately if ordered to evacuate and be sure to plan for your pets.

Local Weather in Hackensack, NJ

56 F°
OVERCAST
40% RAIN