Intelligence analysis of hurricane measures in the tourist city of Honolulu

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Abstract

On the 21st (Tue) of August 2018, governor of Hawaii David Ige declared a state of emergency in the state of Hawaii due to the approach of the large hurricane Lane. Following the declaration of a state of emergency, each of Hawaii's cities were immediately put in a state of high alert. Hurricane information was provided, and hurricane countermeasures were implemented quickly and thoroughly. This paper analyzes intelligence on hurricane measures in Honolulu, Oahu, Hawaii, one of the world's leading tourist cities.

Keywords

hurricane, tourist city, declaration of a state of emergency, intelligence, crisis management

1. Introduction

In late August 2018, the author experienced a hurricane while staying in Honolulu, Hawaii, USA. The hurricane was named Lane, and Governor of Hawaii David Ige declared a state of emergency in the state of Hawaii due to the approach of the large hurricane on the 21st (Tue). Meanwhile, US President Donald Trump declared an emergency in Hawaii on the 23rd (Thu). As a result, the Department of Homeland Security and the Federal Emergency Management Agency (FEMA) were authorized to provide disaster relief. Each of Hawaii's cities was immediately put in a state of high alert following the governor's declaration of a state of emergency. Hurricane information was provided, and hurricane countermeasures were implemented quickly and thoroughly. This paper analyzes intelligence about hurricane measures the author encountered while staying Honolulu, Oahu, Hawaii, one of the world's leading tourist cities, from the perspective of informatics.

2. 2018 Hurricane Lane

The World Meteorological Organization (WMO) defines a hurricane as a tropical cyclone having a maximum wind speed of 33 m/s or more east of 180° longitude in the Pacific Ocean and Atlantic Ocean. Hurricanes are limited to the northern hemisphere, with an average of about 6 occurring annually in the Pacific and about 5 in the Atlantic. In particular, the Atlantic hurricanes often hit the West Indies, Central America, and the Gulf Coast of North America, and are accompanied by large rainstorms, which can cause serious and wide-spread damage to crops and buildings.

2.1 Overview

Hurricane Lane was a tropical cyclone that had the highest rainfall ever recorded in Hawaii, with a cumulative rainfall of 1,321 mm on Mountain View, Hawaii Island. It was also ranked as the tropical cyclone with the second most rainfall in the United States, after Hurricane Harvey in 2017.

According to the National Hurricane Center, Lane was generated from a tropical wave that moved off the coast of Africa on July 31st, 2018, and was finally observed as a tropical cyclone formed at the site several hundred miles from the south coast of Mexico on August 11th. In the next four days, the cyclone strengthened under favorable conditions, whereupon it became a tropical storm on August 15th. It steadily intensified and reached hurricane intensity by August 17th. Rapid intensification followed, and on August 18th, Lane reached the early-stage peak of a Category 4 hurricane.

On August 19th, Lane entered the Central Pacific Basin, where the influence of wind weakened the intensity. However, on August 20th, Lane intensified again to a Category 4 hurricane and reached peak intensity as a Category 5 hurricane early in the morning on August 22th.

As Lane approached the Hawaiian Islands, it began to weaken again under the influence of the wind, falling below the condition for a hurricane on August 25th. For the next few days, the influence of the eastern trade winds increased as Lane weakened, so Lane followed a course west from the Hawaiian Islands. On August 29th, Lane became a remnant low and disappeared shortly thereafter.

Table 1 shows the Saffir-Simple Hurricane Scale. The Saffir-Simpson Hurricane Scale is a 1 to 5 rating based on a hurricane's sustained wind speed. This scale estimates potential property damage. Hurricanes reaching Category 3 and higher are considered major hurricanes because of their potential for significant loss of life and damage. Category 1 and 2 storms are still dangerous, however, and require preventative measures [National Hurricane Center].

Table 1: Saffir-simple hurricane scale (wind speed)

Category	m/s	knots (kn)
Five	≥ 70 m/s	≥ 137 kn
Four	58–69 m/s	113–136 kn
Three	50–57 m/s	96–112 kn
Two	43–49 m/s	83–95 kn
One	33–42 m/s	64–82 kn

2.2 Response

Governor of Hawaii David Ige declared a state of emergency in the state of Hawaii due to the approach of the large hurricane Lane on August 21st (Tue). Following the declaration of a state of emergency, each of Hawaii's cities were immediately put in a state of high alert. A warning was issued to Hawaii Island, and advisories to Maui, Lanai, Molokai, Kahoolawe and Oahu islands.

2.3 Damage

Lane cause considerable rainfall in the eastern region of Hawaii Island, and Hilo recorded the fifth highest rainfall ever in history. Along the Kilauea volcano, the rain generated excessive vapor, which caused whiteouts. In addition, many roads were closed by flooding. Earth and sand from several landslides blocked part of the expressway. In and around Hilo, houses were inundated by flooding from the river, and Waiakea Primary School was also flooded. Areas along the Hilo Bay were particularly affected. Landslides destroyed homes in Hawaiian Acres.

On Maui, fires destroyed homes and cars.

Oahu escaped a direct hit from Lane, but roofs were reported to be blown off houses.

Figure 1 shows the information of Hurricane Lane provided on the web by National Weather Service.
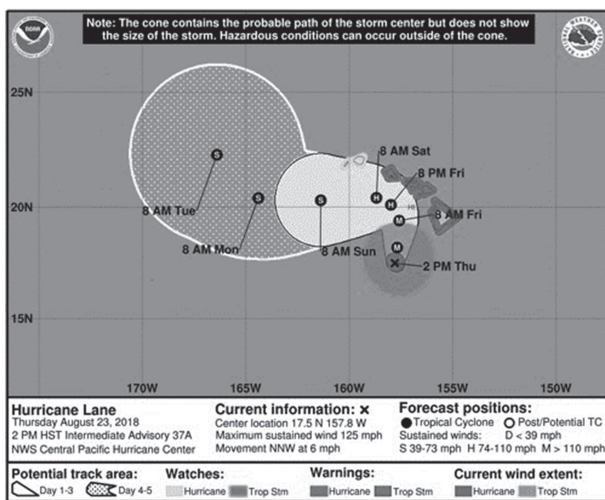

Figure 1: Hurricane Lane information for 14:00 August 23rd. National Weather Service
Source: https://www.weather.gov/.

3. Conditions at Honolulu during the approach of hurricane Lane

In the afternoon of August 23rd (Thu) and 24th (Fri) it was very windy in Honolulu. There were few people and it was quiet. This is a rare scene in Honolulu. There were only a few cars running along Kalakaua Avenue on Waikiki Beach. Commercial vehicles such as tour buses, delivery trucks and taxis were hardly to be seen. The hotel was removing the furniture and sunshades that had been set up around the pool, which was a strange sight.

All sightseeing tours were canceled; shops, restaurants and convenience stores were almost all closed; and transportation was suspended, but tourists were walking around trying to find something open.

Some restaurants serving food were open at a few large hotels, but because employees had been sent home and they were operating with very few people, the hotels were not in the position to have all the restaurants open.

Figure 2 shows the street of Kalakaua on August 24th.

Figure 2: A quiet Kalakaua street on the night of August 24th

Status of major business facilities in Honolulu is as follows.

3.1 Major shopping centers

(1) Royal Hawaiian Center. (Figure 3)
   - Open until 17:00 on August 23rd (Thu).
   - Operations from 24th (Fri) were decided after the announcement of the Hawaii state government.
   - Open for business at 10:00 on 25th (Sat).
(2) International Market Place
   - Open until 16:00 on August 23rd (Thu). Closed all day on 24th (Fri).
   - Open for business at 10:00 on 25th (Sat).
(3) Ala Moana Center
   - Open until 16:00 on August 23rd (Thu). Some stores

Figure 3: Closed Royal Hawaiian Center

closed earlier. Closed all day on 24th (Fri). Open for business at 12:00 on 25th (Sat).

(4) Kahala mall
- Open until 16:00 on August 23rd (Thu). Closed (all stores) all day on 24th (Fri).
- Open for business at 12:00 on August 25th (Sat).

3.2 Major convenience stores in Honolulu
(1) 7-Eleven
- Some stores closed August 23rd (Thu) and 24th.
- Open for business from morning of August 25th (Sat).
(2) ABC Store
- Closed August 23rd (Thu) except for some stores; almost all stores closed on 24th (Fri).
- Open for business from morning of August 25th (Sat).

3.3 Transportation in Honolulu
(1) The Bus
- Operations suspended from 18:00 on August 23rd and all day on 24th.
- Operations started at 14:00 on 25th (Sat). Free bus service throughout the day on 25th (Sat.).
(2) Biki (share bike)
- Customers to return bicycles to the station by 23:59 on August 23rd. Services suspended thereafter.
- Services resumed from 6:00 on 25th (Sat).

3.4 Cultural facilities in Honolulu
(1) National parks in Hawaii
- All national parks closed on August 23rd (Thu).
(2) Iolani Palace
- Closed from August 23rd (Thu) to 26th (Sun). Open from 27th (Mon).
(3) Bishop Museum
- Closed August 24th (Fri) and 25th (Sat).
(4) Honolulu Museum of Art
- Closed from August 23rd (Thu) to 27th (Mon). Open from 28th (Tue).

3.5 Administrative facilities in Honolulu
(1) Consulate General of Japan in Honolulu
- Closed August 23rd (Thu) and 24th (Fri).

3.6 Education-related
(1) All public schools and charter schools, and almost all private schools in Oahu
- Closed August 23rd (Thu) and 24th (Fri).
- Public schools in Hawaii started classes from 27th (Mon).
(2) University of Hawaii at Manoa and Kauai Community College
- Closed on August 23 (Thu). All campuses on Hawaii, Maui, and Molokai were already closed, and the time of reopening was determined according to the weather.

3.7 Shelters
August 23 (Thu), City and County of Honolulu opened shelters. People who considered their homes unable to withstand the hurricane could use the shelter as a last resort and at their own risk (Figure 4).
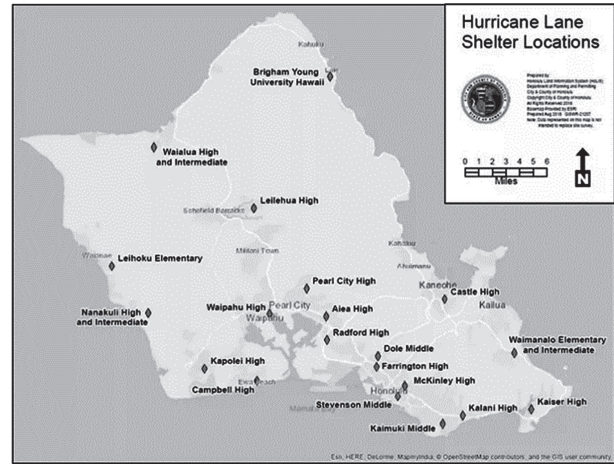

Figure 4: Location of shelters. Exhibit: City and county of Honolulu

The shelters opened were as follows.

Waialua High and Intermediate, Leihoku Elementary, Nanakuli High and Intermediate, Brigham Young University Hawaii, Leilehua High, Waipahu High, Kapolei High, Campbell High, Pearl City High, Aiea High, Radford High, Dole Middle, Farrington High, McKinley High, Stevenson Middle, Kaimuki Middle, Kalani High, Kaiser High, Waimanalo Elementary and Intermediate, Castle High

At 12:00 on August 26th (Sun), the emergency shelters were closed.

4. Intelligence analysis
Measures against hurricane Lane were implemented extremely quickly and thoroughly in Honolulu (Figure 5).

We will examine these from the intelligence cycle.

Figure 5: Travel agent for Japanese tourists prepared for flooding

4.1 Definition of information and intelligence

Since the value of information is generated from analysis, a lot of information needs to be collected. Analyzing the large volume of information collected can create valuable information, that is, intelligence.

There is a very vague difference in meaning and interpretation between knowledge and intelligence. Many researchers have defined intelligence. "Intelligence is knowledge; it is organization and activity," said US intelligence expert Sherman Kent [Sherman Kent, 1951]. In order to produce such knowledge, he emphasizes that an organization producing intelligence and the activity of collecting and analyzing information are essential.

4.2 Intelligence cycle

In order to gain a superiority in information, it is necessary to collect, analyze and evaluate information to create valuable information, that is, to create intelligence.

Figure 6 is called the intelligence cycle and was developed by the Central Intelligence Agency (CIA) in the US. On the information side (the side responsible for information collection and analysis), it is currently used as the standard process for conducting intelligence research in five stages of planning and direction, collection, processing, analysis and product, and dissemination [Sugasawa, 2005; Yoshinari and Ohuchi, 2011].
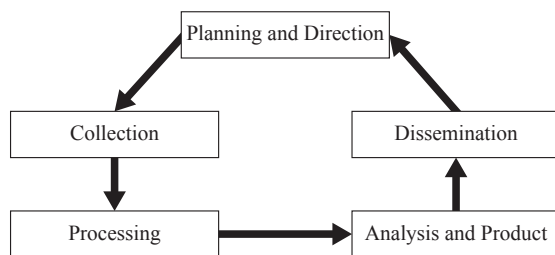

Figure 6: Intelligence cycle (CIA model)

We apply this to the intelligence cycle for measures against hurricane Lane.

• Planning and Direction
  Based on the information on the approach of the large hurricane Lane to the Hawaiian Islands, Governor of Hawaii David Ige declared a state of emergency in Hawaii. Clear instructions were given. Following the governor's declaration of emergency, each of Hawaii's cities was immediately put into a state of emergency. Here too, plans and instructions were implemented. At the national level, two days after the governor's declaration of a state of emergency, US President Donald Trump announced a state of emergency in Hawaii, authorizing the Department of Homeland Security and the Federal Emergency Management Agency (FEMA) to provide disaster relief. The plan and instructions were clear.

• Collection
  The US National Weather Service, National Hurricane Center, Central Pacific Hurricane Center, etc. collected data on the status of the ever-changing Lane.

• Processing/Analysis and Product
  The US National Weather Service, National Hurricane Center, Central Pacific Hurricane Center, etc. predicted changes in scale, course, etc. based on the collected data, conducted analysis, and provided information that contributes to administrative hurricane measures.

• Dissemination
  The Governor of Hawaii strongly recommended tourists to be prepared for evacuation, ensure safety, act with common sense, and pay attention to safety information and updates provided by airlines, hotels and media until hurricane Lane passed the islands of Hawaii. The governor of Hawaii and the mayor of Honolulu provided the latest information on facilities (including airports, buses and other transport agencies, and tourist destinations) that were closed or inaccessible due to the hurricane on Oahu, Hawaii. In fact, at my hotel, the latest information was distributed to each room (Figure 7).

As above, it was found that the measures against the hurricane Lane in Honolulu in 2018 corresponded to an intelligence cycle.
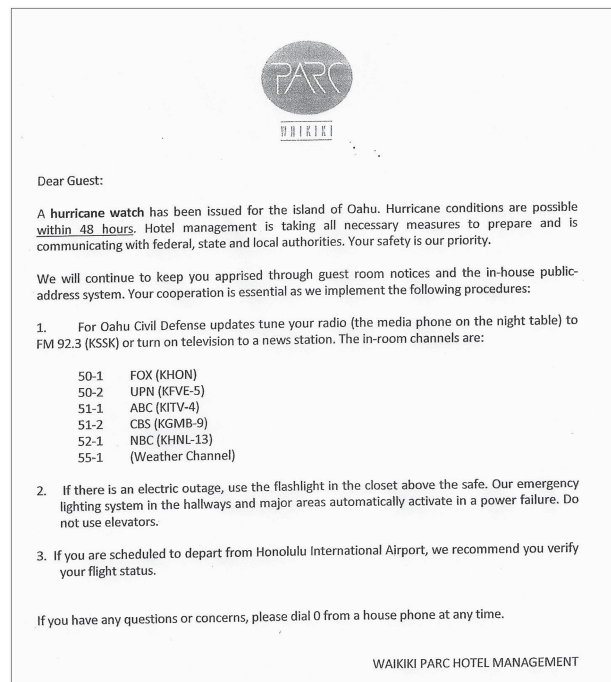

Figure 7: Hurricane Lane information distributed at the hotel

5. Conclusion

In this paper, we conducted an intelligence analysis of hurricane measures in Honolulu. After Hawaii State Governor David Ige declared a state of emergency with respect to the large hurricane Lane, hurricane measures were impressive in their

quick and thorough implementation. This process corresponded to the intelligence cycle by intelligence analysis. In other words, it was found that crisis management by the intelligence cycle is effective in natural disasters.

6. Future research tasks

Japan is a country with many natural disasters such as typhoons, floods, landslides, etc., and various kinds of crisis management for natural disasters are carried out. By way of a system similar to the US declaration of a state of emergency, in Japan, there is a declaration of a disaster emergency based on the Disaster Countermeasure Basic Act issued by the Prime Minister, and a declaration of an emergency based on the Police Act.

As future research tasks, I will compare the US declaration of a state of emergency with the Japanese system, and conduct research on crisis management in tourist areas in particular. Also, although the total damage caused by hurricane Lane has been estimated by several private US economic research organizations, I would like to study the loss limited to Japanese tourism.

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