



Hurricane Dorian

The Response of University of The Bahamas

August to December 2019:

A Case Study for Discussion

William J. Fielding, Vikneswaran Nair, Juliet Glenn-Callender,
Levette Morris & Virginia Ballance

Publisher's Cataloguing-in-Publication data

Fielding, William J. (William James), 1956-

Hurricane Dorian, The response of University of The Bahamas, August to December 2019: A case study for discussion /
William J. Fielding, Vikneswaran Nair, Juliet Glenn-Callender, Levette Morris, and Virginia Ballance.

Description: Nassau, BS: University of The Bahamas, 2022.

p. ; cm.

1. Hurricane survival—Bahamas. 2. Disaster preparedness—Bahamas. 3. Disaster relief—Bahamas. 4. Emergency
management. 5. Disaster aftermath—Social aspects—Bahamas. I. Nair, Vikneswaran, 1970- II, Glenn-Callender, Juliet.
III. Morris, Levette. IV. Ballance, Virginia. V. University of The Bahamas.

GF86.B34 F45 2022

363.34/8068—dc 23

Cover picture: NOAA (2019). https://console.cloud.google.com/storage/browser/_details/gcp-public-data-goes-16



Attribution-NonCommercial-NoDerivs
CC BY-NC-ND

Contents

Foreword	i
Introduction	1
Method and Purpose of This Case Study	1
University of The Bahamas North (UB-North) at the Time of Hurricane Dorian	2
The “New” Campus of UB-North	2
The Storm Itself	3
UB' s Hurricane/Tropical Storm Preparedness	6
Preparing for the Storm	8
Time-line Pre-Hurricane to Landfall as Recorded by UB Electronic Media Accounts	10
The Overall Damage	11
Damage to the Campus	12
Effect of Hurricane Dorian on UB-North Students	13
Immediate Response of UB to Hurricane Dorian	14
UB-North Post Hurricane Dorian: The Way Forward (excerpts) (6th September 2019)	
Dr. Ian Strachan, Vice President	15
Timeline Post-Hurricane Dorian	16
The Academic Impact of Hurricane Dorian on Students	20
Disaster Management Plans	22
Infrastructure Response	22
The UB-North Library after Hurricane Dorian: A Case Study	23
Acknowledgments	24
References and Further Reading	25
Appendix	27

Foreword

In September 2019, the northern islands of The Bahamas, including Grand Bahama, suffered the destructive power of Hurricane Dorian, the strongest hurricane on record to hit The Bahamas. University of The Bahamas North (UB-North) campus was destroyed. This required UB to respond to this loss within the context of the widespread destruction on Grand Bahama, so that it could restart the Fall Semester.

In January 2021, it was agreed that the response of UB to the early days of Hurricane Dorian should be documented as a case study. This brief overview, which uses information primarily from UB-North, demonstrates the complexity of responding to a large-scale natural disaster, both in the short- and long-term. Given the high risk of future hurricanes striking The Bahamas, I hope this case study will make us aware of how we need to prepare for future storms and respond afterwards. Students are encouraged to discuss and debate the actions taken by UB so that they can come to their own conclusions as to how well we responded, and how we might have reacted differently. This process is of the utmost importance because our students of today will be those in authority who will have to make decisions when faced with future storms.

I am particularly grateful to the Office of Information Technology for beginning the implementation of the latest version of Ellucian Banner in October 2016 and having data stored in the Cloud in 2019. This step significantly aided the University in the handling of emergencies associated with disasters. I am also grateful to the members of UB-North community who assisted in this case study. Not only did the employees of UB-North bear the brunt of the catastrophe, but their commitment to UB and our students enabled the relocated campus to reopen just one month after the hurricane, an achievement which is a true testament to the dedication of UB employees.

Dr. Rodney D. Smith
President & CEO, University of The Bahamas

Introduction

Hurricane Dorian was a powerful hurricane which made landfall on Grand Bahama on the 2nd September 2019 causing great destruction by wind and its associated storm surge. While this event may be exceptional, it provides an opportunity to assess what was done and what needs to be done to mitigate the damage caused by major hurricanes and other severe weather events. This case study presents the actions which University of The Bahamas (UB), and, in particular, its campus in Grand Bahama (UB-North) took to prepare for Hurricane Dorian and to respond to the damage inflicted on UB-North campus. Data from various areas of the University were collected to give an overall impression of the big picture of the response of UB-North to the hurricane. The aim of the case study is not to decide the merits or otherwise of UB's actions but rather to provide information which will allow students to discuss and debate the actions taken by UB and decide what might have been done differently and what lessons can be learnt so as to ensure that any similar storm does not disrupt the work of the University. This case study covers the period August 28th to December 2019, with an emphasis on the period prior to the arrival of the storm and the reopening of UB-North in October.

Method and Purpose of this Case Study

This case study does not attempt to give a comprehensive list of UB responses to Hurricane Dorian; rather, it attempts to give a larger picture of its efforts, which are also embedded in an even larger picture of the Government of The Bahamas' relief efforts. A case study within this case study focuses on the library as it is a warning of the irreplaceable damage which a disaster can cause.

This case study will include questions for discussion and reflection which will allow students to assess the response of UB to the hurricane. Students are invited to consider which, if any, of the decisions made should be repeated in the event of another hurricane, either in Grand Bahama or New Providence. Were the decisions made at the appropriate time? Looking back with hindsight, how might things have been done differently to reduce the impact of Hurricane Dorian on UB and its capacity to operate in Fall 2019?

University of The Bahamas North (UB-North) at the Time of Hurricane Dorian

University of The Bahamas received its university charter in November 2016, having previously been the College of The Bahamas. It is the national university of The Bahamas and employs about 200 fulltime faculty and has just under 4,000 students. In 2019/20 its operating budget was almost \$52 million.

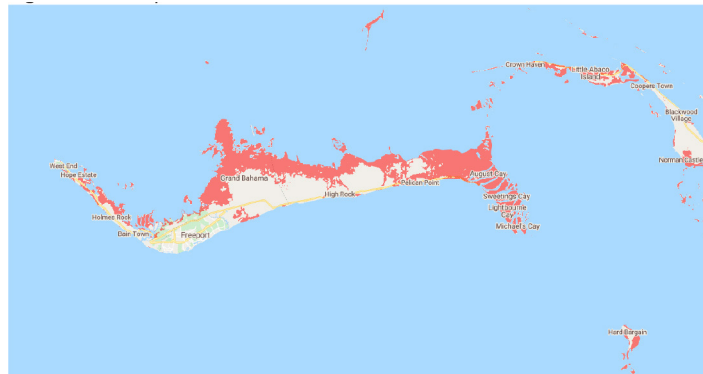
In Fall 2019, there were 342 students enrolled at UB-North with around 33 staff and 11 faculty.

The “New” Campus of UB-North

In 2010, UB-North moved to a new purpose-built structure at a new location in the east of Grand Bahama. As the area was known to be flood-prone, the building was situated on a platform elevated six feet above the flood plain. The building was constructed according to the 2003 Bahamas Building Code, so it was designed to withstand winds of up to 150 mph. The building included hurricane resistant windows and had a sheet metal roof. In 2017, a dormitory was built close-by. This structure was built using a modular design, based on shipping containers, rather than employing a reinforced concrete structure as in the main building.

The flood map of Grand Bahama illustrates the risk of flooding at the eastern end of the island and the potential of flooding from the north engulfing areas well inland (Figure 1).

Figure 1: Flood Prone Areas in Grand Bahama.



Discussion Questions:

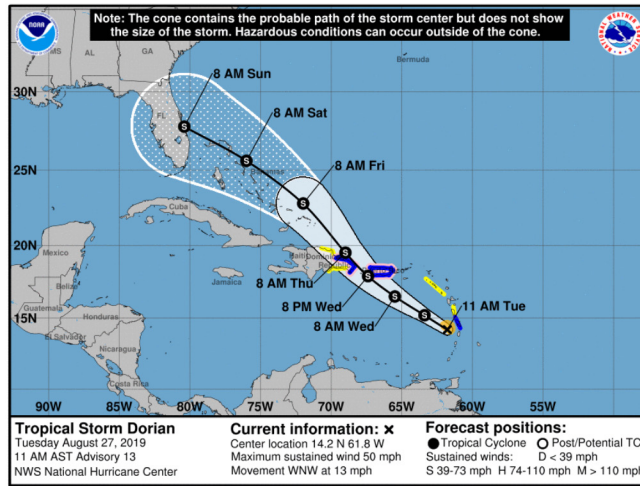
How robust were the buildings at UB-North to withstand wind and floods? Given that design and cost go hand in hand, were the decisions made in the early 2000's appropriate at that time? Given that buildings are often designed with a 40-50 years' life span, what might architects in The Bahamas need to do to build resiliency into structures being built today so that they have a duration of 40-50 years? What might be appropriate considerations for modifying the building code in The Bahamas?

The Storm Itself

“Dorian was the strongest hurricane to hit the northwestern Bahamas in modern records”, according to the US National Hurricane Center Tropical Cyclone Report on Hurricane Dorian (Avila et al., 2020). Its maximum wind speed was 185 mph at landfall on Abaco on the 1st September. The US National Hurricane Center Tropical Cyclone Report indicated that forecasts of Dorian were initially poor (as illustrated in the graphics of the 27th August compared to those of the 30th August or the 31st August, Figures 2, 3, 4 and 5).

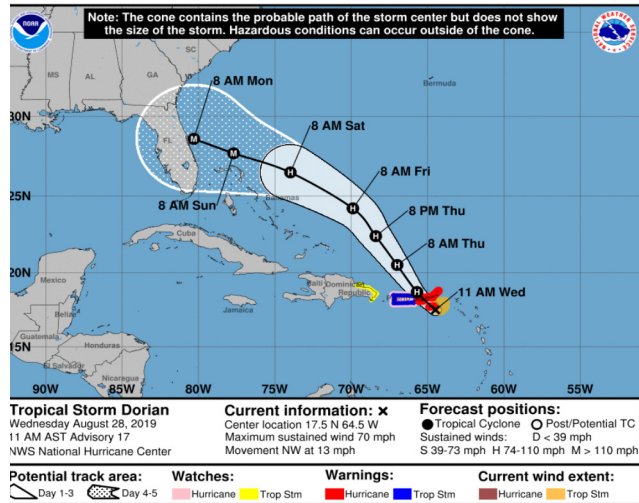
A hurricane watch and, later the same day, a hurricane warning was issued for the Northwestern Bahamas on the 30th August. According to National Emergency Management Agency (NEMA), “A Hurricane Watch is... a first alert for emergency forces and the general public in prospective threatened areas. When your area is under a Hurricane Watch, you should continue normal activities”. A Hurricane Warning “becomes part of advisories when a hurricane is expected to strike an area within 36 hours” (National Emergency Management Agency, 2011). No tropical storm warnings appear to have been issued for Grand Bahama, and a hurricane watch was included in the National Oceanic and Atmospheric Administration, National Hurricane Center Public Advisory on Friday 30th August at 5am. At 5pm it was changed to a hurricane warning. None of the forecasts predicted that the storm would stall over Grand Bahama. Consequently, there was limited preparation time to cope with a major storm, particularly given that the apparent consequences to the forecast changes only became evident after 5pm on a Friday. The fact that the storm arrived sooner than expected shortened the expected preparation time. Hurricane Dorian made landfall at South Riding Point, Grand Bahama with wind speeds of about 180 mph on the 2nd September. The tropical storm warnings for Grand Bahama were discontinued on the 4th September. In addition to the winds, the storm surge at the western end of Grand Bahama was estimated at six feet and 20 feet in the eastern end. Further, some 22.8 inches of rain were recorded at Hope Town, Abaco whereas on the 30th August 12 inches had been forecast.

Figure 2: NHC Forecast Track for Hurricane Dorian on the 27 August, 2019.



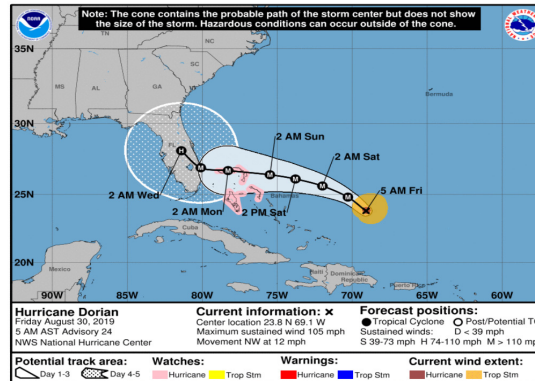
Note: National Hurricane Center, 2019

Figure 3: NHC Forecast Track for Hurricane Dorian on the 28 August, 2019.



Note: National Hurricane Center, 2019.

Figure 4: NHC Forecast Track for Hurricane Dorian on the 30 August, 2019.



Note: National Hurricane Center, 2019.

Figure 5: NHC Forecast Track for Hurricane Dorian on the 31st August, 2019.



Note: National Hurricane Center, 2019.

These weather forecasts demonstrate that meteorologists had difficulty in predicting the track, the intensity and the arrival time of Hurricane Dorian as it approached Grand Bahama. We have found no evidence that tropical storm watches were issued for Grand Bahama. Hurricane watches were issued on the afternoon of Friday 30th, which again shows the uncertainty of officials about the forecast track and intensity. Further, the stall of the storm was another aspect which was predicted only just prior to its arrival. These factors, as well as the fact that the storm approached Grand Bahama at the weekend, all contributed to the difficulty of making and enacting major decisions.

Below we provide the UB preparedness plan which would have guided decisions in their planning for the storm.

**THE UNIVERSITY OF THE BAHAMAS
HIGHLIGHTS OF HURRICANE/TROPICAL STORM PREPAREDNESS
Hurricane/Tropical Storm Faculty/Staff Action Plan
(Refer to Hurricane/Tropical Storm)**

Hurricane/Tropical Storm season officially begins June 1 and extends through November 30. In the event a hurricane/tropical storm threatens an island of The Bahamas on which a campus is located the campus will be evacuated. The following plan outlines procedures and steps that will ensure the safety of the campus community.

1.1

Beginning of Hurricane Season, June 1 Review campus hurricane plan:

Department Directors review Department action plans with employees.

Department Directors check emergency supplies (i.e. garbage bags, plastic sheeting, Sandbags).

In the interest of economy and time, it is recommended that each school and department obtain the emergency supplies required to protect their respective areas of responsibility before June 1.

The Physical Plant stocks these supplies on a limited basis. Contact the Physical Plant at extension 4607 to place a work order requesting the necessary items

2.1

When the NEMA authorities order to evacuate areas prone to flooding the following items should be considered. Approximately 24 -36 hrs. prior to Tropical Storm conditions:

1. President's Office notifies the Emergency Coordinator and Vice Presidents of decision to close and evacuate the campus.
2. Vice Presidents notify their respective areas of responsibility of the decision to close the campus.
3. All University -related functions are to be canceled.
4. Provost/Vice President Academic Affairs notifies Deans to dismiss class.
5. Dean of Students notifies students.
6. Office of Communication notifies campus community and the media of the campus closure.
7. The Director of Physical Plant initiates the University shutdown procedures.
8. All faculty, staff and departments shutdown offices (8 hr. limit).
 - a)Begin implementation of department specific hurricane plan.
 - b)Back up all computer data at this time. Consider making more than one back up and storing these backups in different watertight places. After shutting off, and where possible, all electronic equipment should be placed above the floor and covered with plastic.
 - c)All windows closed, and if possible, locked.
 - d)All Venetian blinds lowered.
 - e)All University vehicles delivered to Security Department.
 - f)Secure labs, and chemicals
 - g)Remove items from refrigerators.
 - h)All non-essential personnel leave the campus at completion of hurricane preparations. Be sure to check out with immediate supervisor. Take personal items, they are not covered by insurance.
 - i)The Security will perform a security check of the campus to verify that persons not working directly with the Emergency Response Team have evacuated the campus.

2.2

10. Physical Plant hurricane procedures.

- a) All personnel report to supervisors for hurricane team assignments.
- b) Vice President, Operations obtains funding to be used after the storm for cleanup. The Physical Plant will keep records all financial transactions until the Finance Department is able to return to campus and reestablish operations.

2.3

11. Security procedures.

- a) All personnel report to Director of Security for assignments.
- b) Make final inspection of premises to confirm complete evacuation of all other persons. (Faculty, staff, students and tenants)

Prior to arrival of tropical storm force winds these items should be considered.

1. Campus is shut down.
2. Physical Plant fuels and stores all vehicles.
3. Physical Plant runs final check, verifies utilities to all buildings have been shut off.
4. Security verifies that all personnel have left the campus and buildings are locked.
5. Campus should be evacuated except for security personnel.

2.4

IMMEDIATELY AFTER THE STORM

1. The Senior Team under direction of the President or a designee, contacts the Emergency Response Team to meet on campus or at a designated site to evaluate damage and develop immediate response plans.

Emergency coordinator and Emergency Response Team assignment:

- Ensures campus is secured from unauthorized access and looting.
- Assesses damage to the campus' physical plant
- Completes immediate survey of campus to identify and isolate safety hazards (biological, electrical, structural, gas leaks, etc.)
- Develops and carries out plan to resume operations.
- Establishes communication networks, handles immediate media inquiries, establishes emergency

communications, assesses damage to telecommunications systems, initiates repair procedures, establishes emergency computing stations, assesses damage to computing services, and initiates repair procedures.

2. Remaining personnel wait to report to campus upon notification by immediate supervisor or through an announcement on the local media services.

Faculty and Staff listen to local radio/TV stations for information.

NOTE: Listen to radio/TV for announcements of when to return to the campus, monitor the University website or contact your supervisor for information about campus status during and following the storm, call the Faculty/Staff Information Hotline: or the Security Department:

3. Department Heads, through normal administrative channels will initiate surveys of departmental status.

4. If you are not assigned to the Emergency Response Team do not return to Campus until advised to do so.

Note: University of The Bahamas.

Discussion Questions:

How do plans such as the one above combine rigor, clarity and nimbleness so that decisions can be made in response to a quickly evolving or uncertain situation? What are the assumptions made in such a plan? What were the strengths and weaknesses of the plan in the light of the unreliable forecasts for Hurricane Dorian?

Preparing for the Storm

An understanding of the approach of the storm to Grand Bahama underpins any analysis of the actions which were taken. An email sent to UB-North employees clearly understates the severity of the events which would unfold, but reflects what might have been reasonably anticipated on Thursday the 29th August. Equally importantly, it reflects the lingering trauma on employees of other recent hurricanes on Grand Bahama, storms which the UB-North infrastructure survived.

Email sent by the Academic Counselor to all employees on Thursday, August 29, 2019 10:44:34 AM

Good morning colleagues,

As you all know Hurricane Dorian is making his way through the Atlantic and is currently threatening The Bahamas. The latest updates have upgraded the storm to hurricane status and by the time it makes landfall on Grand Bahama it can be a category 3- major hurricane.

That being said, apart from the potential material and property damage a storm can leave behind, there is an emotional and psychological impact.

For many of us who have experienced the numerous the storms that have hit Grand Bahama (with Mathew still being fresh in their minds); the thought and experience of an impending storm can cause a tremendous amount of emotional distress and anxiety. As a consequence of this, I encourage to prepare immediately and to take action to improve your wellbeing and mental health during this hurricane season.

Your psychological wellbeing is more important than your property and possession. If you feel you will not be safe at home seek shelter elsewhere.

If you are prone to experience stress and/or anxiety and worry, engage in activities to create a distraction from sounds of the whirling winds and rain outside. Try your best not to look outside during this time. Instead, use this time to spend with your family, have conversations, play games, pray, read that book to have been meaning to read for the past 6 months, meditate, engage in relaxation exercises, watch movies (on your fully charged laptop of course); do anything to keep your mind occupied and engaged (except getting drunk, you need to keep a clear mind at during this time). If you live alone I encourage you to either invite family and friends to come stay with you or ask to stay with them (this is not the time to isolate yourself).

It is all of our hope and prayer, that this storm will not make landfall on our island. Grand Bahama needs a reprieve from any further devastation as it has not recovered from as far back as hurricanes Jean and Francis. So lets us be as prepared as we possibly can both physically and mentally.

Please share with those who I may have unintentionally missed.

Stay Safe Everyone.

Sawyer, G. (2019, August 29). *Email sent to all UB-North employees.*

A statement issued by UB on the 29th August noted, "Please be advised that as a result of the threat of Hurricane Dorian, University of The Bahamas' Oakes Field Campus and Grosvenor Close Centre, including Chapter One Bookstore and the Harry C. Moore Library will close at 3:00 p.m. on Friday, 30th August 2019. However, the UB-North Campus in East Grand Bahama as well as operations at the Continuing Education & Lifelong Learning (CELEARN) and Recruitment & Admissions centre at the Teachers Credit Union building on West Atlantic Drive will close at 8:00 p.m. on Thursday, 29th August 2019."

Consequently, UB-North was only given one working day to prepare for the storm. It should be noted that this statement said the wind speed of Hurricane Dorian was 85 mph. While nothing specific was said about preparations at UB-North, those at the UB sites on New Providence included, "UB's Physical Plant Department has begun to disseminate plastic sheeting to protect computers and other sensitive electronic equipment and will continue to prepare by installing window protections and securing refuse containers."

Discussion Questions:

Based upon the UB statements, how prepared was UB for Hurricane Dorian and were the preparations adequate given what was known about the storm? In retrospect, would you consider the preparations reasonable?

Timeline Pre-Hurricane to Landfall as Recorded by UB Electronic Media Accounts

Below we provide a selection of electronic communications regarding Hurricane Dorian.

Selected Pre-Hurricane Dorian WhatsApp Messages Between UB-North Employees

August 27 @ 2:30 p.m.	University Relations shared the 2019 Storm Guide with University employees and students.
August 29 @ 1:54 p.m.	Dr. Strachan sent out the first Closure Notice: closure from noon 30th August
August 29 @ 2:30 p.m.	Storm Protocol Meeting was held with area leaders.
August 29 @ 4:20 p.m.	OIT Notice to staff: unplug all computers and printers from the outlets in their offices and also cover the PCs using plastics.
August 29 @ 4:40 p.m.	Dr. Strachan revised the Closure Notice: closure from 8pm 29th August
August 29 @ 5:47 p.m.	University Relations shared Alert No. 8 on Hurricane Dorian
August 29 @ 7:17 p.m.	Early Closure Notice was sent out to all employees and students
August 29, 2019	Dr. Strachan created the WhatsApp group "UB North Storm Watch."

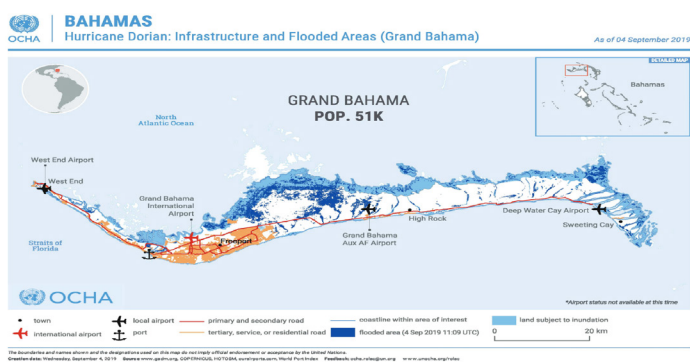
Date	UB North Facebook account	UB Facebook	UB emails	UB Webpage
Aug 29	Windy.com wind map and weather forecast			UB. (2019, August 29). Early Closure and Preparations for Hurricane Dorian. https://www.ub.edu.bs/early-closure-preparations-hurricane-dorian/
Aug 30	NHC Dorian Alert #8	Statement: on early closure and preparations UB Severe Weather Checkpoint on webpage https://www.facebook.com/UniversityofTheBahamas/photos/a.10150615119237144/10156903966127144		
Sept 1	Landfall at Elbow Cay, Great Abaco, at 1640 UTC with estimated winds of 160 kt – moving at 5 mph	Notice: campus and centres closures https://www.facebook.com/UniversityofTheBahamas/videos/358890328386127	UB in New Providence and GB Remain Closed (press release)	UNIVERSITY OF THE BAHAMAS IN NEW PROVIDENCE AND GRAND BAHAMA REMAIN CLOSED 1 st September 2019. NOTICE: Due to Hurricane Dorian, all campuses and centres of University of The Bahamas in New Providence and Grand Bahama remain closed until further notice. At the appropriate time, a subsequent notice will be issued on the resumption of operations following the passage of the hurricane. Faculty, staff, students and administrators are urged to continue monitoring local news and all UB official communication channels for further updates.
Sept 2	Landfall near South Riding Point on Grand Bahama near 0215 UTC with 155-kt winds. – slowing at 1.2 mph. Stalling north of GB	Message from the President of the UB Notice: essential personnel in NP to return to work https://www.facebook.com/UniversityofTheBahamas/posts/10156913610017144		
Sept 3	Dropping to Cat4 stationary, started moving NW direction at about 15:00	Notice: essential service personnel on New Providence NO LONGER to report for duty		ESSENTIAL SERVICE PERSONNEL TO RETURN TO DUTY 3 rd September 2019 NOTICE Campus Police and Security staff of University of The Bahamas, Oakes Field Campus and Grosvenor Close Centre, are expected to report as normal today for their designated shifts. Office of Information Technology and Physical Plant personnel are expected to return to work on Wednesday, 4th September. The public is advised that classes remain suspended and the University remains closed until further notice. Please exercise extreme caution in navigating the streets of New Providence.

The Overall Damage

The extent of the inland flooding and inundation is clear in the map from the United Nations Office for the Coordination of Humanitarian Affairs of the 4th September 2019 (Figure 6).

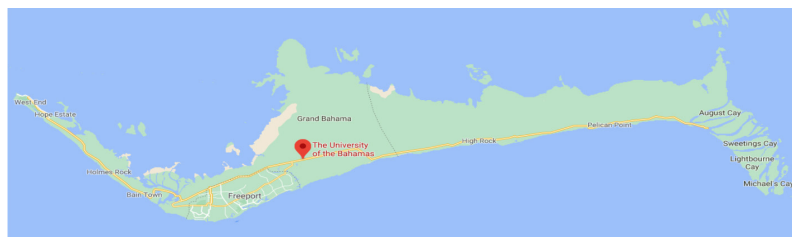
The Inter-American Development Bank and Economic Commission for Latin America and the Caribbean report (2020) on the damage assessment of Hurricane Dorian gives a comprehensive overview of the damage caused throughout Grand Bahama and on education facilities in particular, although its report contains inaccuracies with respect to UB-North and its response in terms of re-opening. The international intergovernmental report is required reading to gain insight as to the magnitude of the damage.

Figure 6: Infrastructure and Flooded Areas on Grand Bahama.



Note: OCHA (2019, September 4). Hurricane Dorian: Infrastructure and Flooded Areas (Grand Bahama).

Figure 7: Location of University of The Bahamas-North Campus on Grand Bahama.



Although the UB-North campus appears to be built inland, the low elevation results in its still being at risk for flooding (Figure 7). It was the flooding, caused by the storm surge, rather than the wind which caused major damage to the building and its contents. (However, distinguishing one cause from another would not be trivial). Further, it should be remembered that it was sea water which inundated the campus, making the damage worse than if it was fresh water. The extent of flooding is shown in Figure 6.

Damage to the Campus

A professional damage assessment described the damage as “major”. Damage to the main campus building was estimated at \$6 million by the loss adjusters. This was the estimate for the repairs as well as the restoration required to the fixtures and other contents (furniture etc.). The main building was (Figure 8) estimated to have suffered 15% damage. The overall impact on the structure of the dormitory building (built from modified shipping containers) was estimated to be 30% (Figure 9). None of the instructional spaces were functional after the storm and there was no functional electricity system, so making the building unusable for teaching.

Figure 8: Aerial View of UB-North Prior to Hurricane Dorian.



Figure 9: The Damaged Main Building and Dormitory on the University Campus.



Note: Photographs from Adrian Rollins, Structural Engineer. Used with permission.

Effect of Hurricane Dorian on UB-North Students

The storm had far-reaching effects on many students, Table 1. Following the storm, a study of 220 students indicated that almost 25% were displaced from their homes as opposed to about 10% of them who lived in homes which had not been damaged. While about 50% of students had not suffered material loss, over 11% had lost everything. Despite the trauma of the storm, about two thirds of the students wanted to continue their studies. With 5% of students experiencing the death of a family member or friend, this irreversible loss compounded the material losses and the mental stress associated with the event.

Table 1: *Effects of Hurricane Dorian on Students.*

Event	Percentage
Experienced death of family or friends	4.5%
Displaced from home	22.7%
Type of Damage:	
Flooding	37.3%
Leaking	33.2%
Structural	20.5%
No Damage	10.5%
No Response	9.1%
Extent of Material Loss:	
Everything	11.4%
Few Things	27.7%
Nothing	49.6%
No Response	11.4%
The three most commonly reported immediate needs:	
Water	49.1%
Food	38.2%
Clothes	8.2%
Counselling Support:	
Needing support	11.8%
Not needing support	61.4%
Maybe/Not Sure	5.9%
No Response	20.9%
Willingness to continue the term:	
Yes	64.6%
No	6.6%
Transfer from UB	0.9%
No Response	21.8%

Discussion Questions: What may have contributed to the relatively small number of students wanting counselling after such a stressful experience? What might be the anticipated long and short-term effects on students having experienced the trauma identified in the survey?

Immediate Response of UB-North to Hurricane Dorian

Various newspapers reported that residents of Grand Bahama were unprepared. Even having experienced a number of storms in recent years, the storm surge, and its destructive power seem to have been unexpected. The thesis of Asenso (2020) provides insight as to the role of media in the recovery from Hurricane Dorian. Social media was also a key source of information and influence.

Given the fact that classes could not continue at the campus buildings, and that they could not be made operable in the short term, there were two contrasting options available. One would have been to have cancelled the semester, the other was to attempt to provide instruction in a location which was serviceable. Given the widespread damage across the island and limited electricity and Internet services, any instruction would be far from “normal”, and also take place against the background of the stress and trauma of the storm, and the uncertainty that other storms could also be experienced. In fact, there were 14 named storms after Hurricane Dorian and on the 14th September Tropical Storm Humberto passed to the east of Grand Bahama. A plan was formulated to continue instruction and put into action. In (Figure 10) parallel with this plan, students were given the option of completing the Fall semester at Hampton University in the state of Virginia (Barker, 2019).

Figure 10: *Employees of UB-North Gather to Plan the Way Forward.*



UB-North’s response to the disaster was underpinned by a desire to introduce as much normalcy into the lives of students and employees as possible. This entailed the resumption of classes and the structure which an academic calendar brings. Donations and other support were means by which students and employees could move forward and replace damaged items and so start them on the road to material recovery. The waiving of various educational costs by UB-North recognized the disruption which the storm had brought to the livelihoods of students. The availability of counselling was in response to the effects of previous storms, and the need of students. By the end of 2020, the UB Hurricane Relief Recovery fund had raised \$462,069.71.

The use of UB-North Physical Plant staff to assist employees to remove hurricane debris from their gardens was another attempt to assist with the return to normalcy and so restore order to the disorder caused by the storm. Until one’s home and environment are restored, there are daily reminders of the emotional scars which impair one’s ability to perform well whether at work or in the classroom. The press release from the Grand Bahama Office of the Prime Minister reported on the relief efforts in Grand Bahama up to September 2020 highlighting the scale and scope of the recovery effort (Office of the Prime Minister Grand Bahama, 2020).

UB-North Post Hurricane Dorian: The Way Forward (excerpts) (6th September 2019)

Dr. Ian Strachan, Vice President

Faculty are committed to supporting Grand Bahamians' access to higher education and honoring their hunger for personal improvement, as evidenced by the increased enrolment we witnessed at the start of fall semester. (We have 535 students enrolled as opposed to 430 in Fall 2019.) We have the will and the access to facilities necessary to deliver on the semester's schedule of courses. We want to make classes possible for as many students as are willing and able to continue. It is vital to the institution's continued presence on the island that we respond proactively, and vital to the ethos of the community that we return some semblance of normalcy to an otherwise shell-shocked region.

Action Plan:

- Classes will continue as normal at the Downtown Centre where we have 3 classrooms. So far only 2 of the classes have been scheduled and the weekends are wide open for all three spaces. The third class room will be put to full use.
- The computer lab on the second floor at the East GB campus will be relocated to UB downtown to facilitate computer classes and to allow for students to have 24 hour 7 days a week access to do school work. Campus security will keep the facility guarded.
- Science faculty have identified Bishop Michael Eldon School [BMES] as the ideal location for the delivery of laboratory instructional hours for Biology, Physics and Chemistry. In fact, their school labs are considered superior to those of UB-North. We have already secured approval from BMES to use their laboratories between 4 and 10pm Monday through Friday and on weekends.
- There are 4 vacant spaces at UB downtown, these will be converted to common office spaces with computers (redeployed from the 2 other upstairs labs and the upstairs classrooms at East GB campus.) This will provide work spaces for clerical staff and managers to carry on their work.
- Other classes will be offered at a central location in Freeport city. There are three options which will be explored and a decision made by Monday Sept. 9th: a) Ascension Anglican Church Hall can facilitate the set-up 4 classrooms and allow us to run our day time classes at the same times they were offered at the start of the term. This will enable minimal disruption. Classroom furniture would be relocated from East GB campus and brought to the hall and partitions set up. B) Sunland Baptist Academy is available to us to use 7 days a week, 4-10pm weekdays, Saturday and Sunday all day. All their instructional spaces are air conditioned. C) Lastly, we can approach the Ministry of Education for the use of Sister Mary Patricia Junior School after hours and on weekends.
- We propose to restart the semester on Monday September 30th and run for 10 weeks, until Sunday December 8th. Exams will be held December 9th through the 22nd. Final grades will be submitted by January 5th. The new term would begin January 13th, 2020.
- Students who do not feel able to continue school due to the challenges caused by the storm will be allowed to take incompletes and thereby suffer no academic penalty.
- The Residence Hall is uninhabitable. There are some 20 non-Grand Bahamian residents of the Hall. We will seek to facilitate all those who wish to relocate to New Providence. Those who wish to remain we will seek to assist in finding them off-campus housing.
- Janitorial staff and campus security will work between the three spaces we will be using: UB downtown, BMES labs and whichever other facility we decide for the balance of classes.
- Handymen will be engaged in clean up, salvage work, demolition, disposal, new classroom set up, furniture restoration and fabrication, and storage.
- A number of faculty will explore delivering the remainder of their courses on line. The 24-hour lab classroom should help provide a means for those students who do not have technology of their own to participate in such classes.
- Faculty will extend class time to make up for lost hours and also potentially hold an additional class per week, where possible.
- Key OIT assets and networking will be rerouted to UB Downtown.
- A general meeting will be held for UB-North students next week Tuesday September 10th at Jubilee Cathedral to bring them up to speed on the action plan and to begin more coordinated support for students based on their individual circumstances and needs.

Timeline Post-Hurricane Dorian

The timeline below based upon electronic communications illustrates the actions taken in the initial stages of the recovery process.

Date	UB North Facebook account	UB Facebook	UB emails	UB Webpage
Sept 4		Hurricane Dorian Relief appeal https://www.facebook.com/UniversityofTheBah/videos/1158048174396991		UB RESUMING OPERATIONS IN NEW PROVIDENCE <i>4th September, 2019</i> All faculty and staff of University of The Bahamas in New Providence are to return to work on Thursday, 5 th September 2019. University operations will resume at the Oakes Field Campus and Grosvenor Close Centre on this date. Classes in New Providence will resume on Friday, 6 th September 2019. The University of The Bahamas-North campus in East Grand Bahama and the CELEARN centre in Freeport remain closed and classes are suspended until further notice. An official announcement regarding relief for faculty, staff and students of this campus is forthcoming. Additionally, all faculty and staff are to attend a Special Call meeting on Thursday, 5 th Sept at 12 p.m. in the Performing Arts Centre at the Oakes Field Campus.
Sept 5	Announcement: under no circumstance is this semester at UB-North cancelled. Among comments is announcement of Hampton University offer of free tuition, room and board to 600 students.	Notice: UB resuming operations in New Providence Special Call meeting for Sept 6 on New Providence https://www.facebook.com/UniversityofTheBah/posts/10156920068657144		
Sept 6		Hurricane Dorian relief initiative Message from the President of UB		
Sept 8	Statement from VP-UB-North (separate copy attached) Comment to invite students to join the WhatsApp Hotline	#UBCares accepting donations Statement from VP-UB-North Statement: Study abroad offer of assistance		STATEMENT FROM THE VICE-PRESIDENT OF UNIVERSITY OF THE BAHAMAS-NORTH https://www.ub.edu.bs/statement-vice-president-university-bahamas-north/
Sept 10		Clarion special edition focusing on HD's effect on the UB community (no longer available) https://www.facebook.com/UniversityofTheBah/posts/10156931825187144 UB President issues Matching Gift Challenge for Hurricane relief https://www.facebook.com/UniversityofTheBah/posts/10156933858817144	Grand Bahama and Abaco students are excused from the outstanding balances deadline	
Sept 11		Video of President Smith		
Sept 12	Report of a general meeting for all students at Jubilee Cathedral on Sept 10	National Art Gallery offers creative space sanctuary		
Sept 14	Video from ZNS			

Timeline Post-Hurricane Dorian

Date	UB North Facebook account	UB Facebook	UB emails	UB Webpage
Sept 15	Landlord application to rent to UB-North students			
Sept 20	Photograph of UB-North group			
Sept 23	Revised fall schedule published YouTube video: Aftermath of Hurricane Dorian at UB-North https://www.facebook.com/UniversityofTheBah/posts/10156972282577144			
			Faculty meeting with Ian Strachan. Student Affairs also gave data on students impacted	
Sept 26		Video: Aftermath of Hurricane Dorian		
Sept 30	Welcome back care packages Hashtag #UBNStrong Welcome! Classes have started at Bishop Michael Eldon School Hashtag #UBNorthRising	Photos of UB-North staff, destroyed campus courtyard, and boxes of donations http://ow.ly/Avyo30pCxQE		
Oct 1	Changed photo to UB flag and Bahamas flag	Alumni held a meeting Sept 19. Reported October 1 https://www.facebook.com/UniversityofTheBah/photos/a.452913982143/10156985415612144 Call for papers for Sustainable Grand Bahama conference https://www.facebook.com/UniversityofTheBah/photos/a.452913982143/10156985951352144		
Oct 4		University Drive radio show about Hurricane Dorian. Written word series: a healing event		
Oct 8		Photo of UB-North flags and of classes at Bishop Michael Eldon School		
Oct 13	Computer lab photo			
Oct 15	Video UB North Rising: classes resumed			
Oct 18		University Drive Radio show about illegal migration and displaced people as a result of Hurricane Dorian https://www.facebook.com/UniversityofTheBah/photos/a.452913982143/10157036104687144		
Oct 21		Disaster and Crisis Communications Management in the Media – panel discussion		
Oct 25	Notice: Apply for Spring 2020			
Nov 15		English Studies Voices from the storm post-Dorian recovery through journaling		

Timeline Post-Hurricane Dorian

Date	UB North Facebook account	UB Facebook	UB emails	UB Webpage
Nov 20		Announcement about the establishment of the CCARR Climate Change Adaptation and Resilience Research Centre		
Nov 21	Mental health seminar to be held November 22			
Nov 24	Video of this seminar			
Dec 5	UB-North and Student Government Association hold "save a life" seminar with Red Cross			
Dec 11	Photo of Grand Bahama residents receiving donated furniture			
Dec 14	Announcement of the Sustainable Grand Bahama: Hurricane Dorian conference to be held March 5-6			
Dec 22	Christmas Jingle Party			

Selected WhatsApp Messages Among UB-North Employees, Post Hurricane Dorian

September 4, @ 4:16 p.m.	Dr. Strachan started adding employees' names to the WhatsApp group and posted his first status report. "Our goal is to re-convene classes on Monday, September 30th."
September 4, @ 4:24 p.m.	Dr. Ian Strachan: Reports damage of UB North campus.
September 5	Site administrators added additional names to the group chat.
	Fake news about the commencement of classes began circulating on social media.
Friday, September 6	Dr. Rodney Smith's message to UB-North employees and students was posted to the group chat.
Sunday, September 8	UB statement on Study Abroad Offer of Assistance was posted to the group chat
Sunday, September 8	University Relations sent out a statement to the UB community from the VP of UB-North. This statement was also posted to the WhatsApp group
Tuesday, September 10	A general meeting for students and faculty was held at Jubilee Cathedral at 1:00 p.m. The purpose of the meeting was to update the community on plans for reconvening the semester.
Friday, September 13	Hurricane Dorian University of The Bahamas-North Student Status Assessment
Friday, September 20	Creation of UB-North Employee Directory and employees' group photo was taken in front of TCUB.
Monday, September 23	Dr. Strachan shared the revised schedule for Fall 2019
Thursday, September 26	The campus received some supplies from the Nassau campus
Sunday, September 29	UB-North banner went up at TCUB
Monday, September 30	Classes reconvened at TCUB
Friday, November 15	Gladys Sawyer, Academic Counselor, email about Identifying Students at Risk
Tuesday, November 26	List of UB-North Employees who suffered damages to their homes

WhatsApp message:

6/9/2019 MESSAGE FROM THE PRESIDENT OF UNIVERSITY OF THE BAHAMAS

Dear Colleagues,

Faculty, Staff and Students of UB-North: We, your colleagues and peers in New Providence, are praying for you each and every minute and we are mobilizing support to help you cope with the trauma and agony caused by Hurricane Dorian. Our hearts are aching as we can only imagine what our brothers and sisters are going through in Grand Bahama and Abaco. Yet we remain hopeful and inspired by your resilience. As you may know, the storm's fierce flood waters and winds caused massive devastation to the UB-North campus. The first floor of the administrative building was gutted and Hawksbill Hall appears to be severely compromised. Our Oakes Field Campus and Grosvenor Close Centre sustained only moderate cosmetic damage and we are slowly coming back online. Colleagues and students, please know that we are working as fast as we can to help you. Hurricane relief donations are being collected at several locations at the Oakes Field Campus and we are preparing to get supplies – particularly water and non-perishable food items – to you as quickly as possible and continuously. UB counsellors are already being mobilized to come over, once officials permit, to counsel you through the severe emotional and psychological after effects of this tragedy. UB volunteers are also being coordinated to help with restoration efforts. Please hang in there, stay in touch with each other as best as you can. Help comfort each other, and know that you are in our thoughts and prayers. The entire University community is also here to be our brothers' keeper and help lift your burdens. Remember, Divine Love is in Control and all is well. With Love and Blessings, Rodney D. Smith, Ed.D.

Discussion Questions: What do you learn about the UB response to Hurricane Dorian? Notice the uneven use of various means of communication. Does this seem appropriate? What else might you have done in the aftermath of the storm? What might be the limitations of relying too heavily on electronic communications?

The Academic Impact of Hurricane Dorian on Students

Hurricane Dorian arrived on the 1st September, about two weeks into the Fall 2019 semester. The academic impact on UB students can be assessed through comparison of the median grades before and after Hurricane Dorian. Overall, the storm had little impact on grades, although a larger percentage of students withdrew ("W" grade), Table 2. than appears usual. In Fall 2019, 7 out of 144 (4.9%) class sections were cancelled which affected approximately 49 students.

Table 2: Median Grades of Students Enrolled at UB-North.

Semester	Combined	2 Year	4 Year	"W" Grades Percentage
Spring 2018	B	C+	B	2.02%
Fall 2018	B	C+	B	2.84%
Spring 2019	B	B-	B	2.21%
Fall 2019	B	B-	B	4.52%
Spring 2020	B+	B	B+	1.79%

Source : Office of Institutional Research

The cohort of 43 UB-North students who completed the Fall 2019 semester at Hampton University in Virginia, obtained similar grades as those who remained in Grand Bahama, Table 3.

Table 3: Median Grade of UB-North Students who Remained in Grand Bahama and those Students who Completed the Semester at Hampton University.

Semester	Hampton University Cohort	Overall UB-North
Spring 2019	B	B
Fall 2019	B	B
Spring 2020	B	B+

Source : Office of Institutional Research

Natural disasters are typically not gender neutral in their effects (Bleeker et al., 2021). This is seen in the change in the grade differential in median grades in Fall 2019. In this semester, the males did as well as the females, which is in contrast with other semesters when the median grade for the females was higher than median grades for the males, Table 4.

Table 4: *Median Grades of UB-North Students, by Sex, before and after Hurricane Dorian.*

Semester	Male	Female
Spring 2018	C+	B
Fall 2018	B-	B
Spring 2019	B-	B
Fall 2019	B	B
Spring 2020	B	B+

Source: Office of Institutional Research

In the longer-term, the number of students enrolled at UB-North declined slightly, with the largest decline being in part-time students, when comparing Spring on Spring enrollment, Table 5.

Table 5: *Number of Students Enrolled at UB-North before and after Hurricane Dorian.*

Status	Spring 2019	Fall 2019	Spring 2020
Full-Time	210	273	238
Associates	23	26	28
Baccalaureate	187	247	210
Part-Time	92	69	53
Associates	13	12	13
Baccalaureate	79	57	40
Grand Total	302	342	291

Note: Office of Institutional Research

Disaster Management Plans

Various disaster management plans have been written, at the regional (Caribbean Disaster Emergency Response Agency, 2004), national level (National Emergency Management Agency, 2006, 2018) and at the island level (Grand Bahama Disaster Consultative Committee, 2018) as well as at the institutional level, such as that of University of The Bahamas. Hurricane Dorian would have tested the value of these, and in particular the COB/UB, “Emergency Response Management Policy” of 2013 which can be found in the appendix.

One outcome from the disaster was recognition that the current UB disaster management plan required revision. The title of the draft 2021 UB-North “Hurricane & Severe Weather Procedures Manual” 2021 makes it clear that policies need to be disaster specific. Disaster preparation policies can assume a linear progression in events which trigger responses, but as was the case with Hurricane Dorian, no tropical storm watches or warnings were apparently issued which would have triggered further actions.

Discussion Questions: What is your evaluation of the 2013 COB/UB “Emergency Response Management Policy”? What other considerations does UB need to take into account when preparing and responding to a hurricane? What is your evaluation of the “Hurricane & Severe Weather Procedures Manual 2021”? What would your disaster management plan look like? What would you do differently?

Infrastructure Response

This is clearly a longer-term response. How and where UB-North rebuilds will need to be informed by the damage caused by Hurricane Dorian and what was learned as a result of previous storms such as Hurricane Jeanne and Hurricane Wilma (Hughey, 2008). While the main UB-North building was built “to code”, measures may be required to build beyond the 2003 Bahamas Building Code. Given that the building was most severely affected by flooding rather than by wind, the location, especially the elevation of new/restored buildings will need to be considered. A balance between building costs and risk will be a key element in this. Further, given that damage can be expected to be greatest on the ground floor due to the flooding, how can the internal allocation of space balance risk damage with convenience of use of the facilities in the buildings? The study of the library included in this document highlights this tension.

Discussion Questions: Given the predicted changes in the severity and frequency of hurricanes associated with climate change, how should Grand Bahama rebuild, and in particular how should UB-North repair/rebuild its campus? Is it even appropriate to consider repairing the current buildings? If the campus were to be relocated, where should this be? Such considerations would include the overall plans of the UB as a whole as outlined in its Strategic Plan 2019-2024 and development of academic and research activities on Grand Bahama as well as the costs of reconstruction.

The UB-North Library after Hurricane Dorian: A Case Study

Juliet Glenn-Callender, UB-North Campus Librarian

We lost the physical structure that housed the library and its contents. That included office equipment and furniture, 20 computers, printers and scanners, and our 5,000-item book collection (including over 2,000 Bahamian books, reference books etc.), 300-item serials collection, 2,500 vertical files (newspaper clippings) and over 800 pamphlets. The pamphlet collection included articles and documents about Grand Bahama. A plan was in process to digitize these materials, most of which were irreplaceable, and in some cases, the UB-North Library held the only copy of the document in the country.

We implemented a phased plan to provide continuity of library services. Existing tools and resources in electronic format were maximized in the short-term. Students, faculty and staff became accustomed to using email, telephone, and WhatsApp to get help locating resources, advice on citation styles and answers to in-depth reference queries. While UB-North resumed administrative operations at the CeLEARN campus at the Teacher's Credit Union Building, there was no office space made available for the library. Therefore, in the short term, library personnel depended on using computer and internet access from home to continue to serve our community.

Rebuilding Collections

We prioritized which collection or collections were most important to us to start the rebuilding process. We sought help from other librarians, including Duke University, who suggested a two-prong strategy to recovery and rebuilding the library and its collections: i) rebuilding the local, archival collection and ii) rebuilding collections to support the curriculum for teaching and basic research. The Library Associate identified over 200 electronic documents from the pamphlet collection to be replaced, as well as Bahamian and Caribbean materials that could be shared. Other Bahamian materials could be requested from the library collections in Nassau.

Lists of needed materials were compiled and forwarded to the University Librarian to facilitate formal requests for donations to start rebuilding the collection. We received over 300 volumes from St. Georges University in Grenada and 5,000 volumes from Book Aid International. We set up an Amazon Wish List for Caribbean literature titles and subsequently received approximately 30 books. We also received gifts from both regional and international donors.

Reconnecting with Users

An initial challenge was to connect with regular users. After shared office space was made available for the Library Associate at the Teacher's Credit Union Building, she was available at least three days a week as an onsite point of contact. Students were either assisted on the spot or directed to contact the Librarian via email, thereby increasing the numbers of queries and use of the electronic resources that the University Libraries provided.

Rethinking Reference

The UB-North Library initiated an aggressive awareness programme to ensure that students, faculty and staff knew that the library was operating and how services would be delivered. The Office of Student Services circulated a How-to Guide for the UB-North Library to students outlining the services, delivery methods and how to access library services remotely. UB-North Library staff used email, WhatsApp and the telephone as well as scheduled face-to-face consultations for in depth reference queries at the campus if requested.

Relocating

Realizing that the long-term goal of a new library on the proposed new campus might not happen until 2022 or 2023, we focused on finding a space for the medium term. We located space at the Sir Charles Hayward Public Library in downtown Freeport large enough to accommodate staff, a small print collection, access to computers and printing and to offer reference services and library instruction sessions.

Reflecting on Disaster Preparedness

As we reflect on Hurricane Dorian, we had a plan on how to secure the furniture and equipment on the premises. However, we did not anticipate that water would destroy the interior of the ground floor of the building, where the library was located. In retrospect, we realize that the library should have been situated on the upper level of the building in order to protect it from potential flood damage. The University Libraries had a plan for preparing for the disaster, but no post-disaster or recovery plan. Staff were left without a blueprint on how to proceed in the wake of a disaster.

Rethinking - Doing Things Differently Post-Hurricane Dorian

The UB-North Library has had to rethink how it provides services: moving from face-to-face to virtual. Rethinking the formats of materials in library collections: moving from print to digital, developing ebook collections, creating digitized materials. Rethinking how to configure the spaces that our patrons utilize. Rethinking the types of services provided: promoting Bring Your Own Device with the library providing charging stations for devices and comfortable seating rather than a computer lab and offering self-service printing.

Reality - Going Forward

Hurricane Dorian has emphasized the need to create digital archives of our most precious historical documents to preserve them for future generations. This requires us to use cloud storage – not just offsite physical backups- to ensure continued access to resources. Librarians will need to explore apps and software that can provide services in

Acknowledgements

The authors are grateful for the assistance of Dr. Ian Strachan, Campus President of University of The Bahamas-North, our colleagues in various departments of University of The Bahamas and Adrian V. Rollins, Civil and Structural Engineers, for permission to include some of their pictures of the University campus buildings.

References and Further Reading

- Andone, D. (2019). In the Bahamas, social media is a vital tool in the search for missing loved ones. <https://edition.cnn.com/2019/09/07/americas/bahamas-dorian-missing-people/index.html>
- Asenso, B. K. (2020). Assessing local media role in disaster recovery and reconstruction process in the Bahamas post-Hurricane Dorian [Unpublished master's thesis]. McGill University.
- Avila, L. A., Stewart, S. R., Berg, R., & Hagen, A. B. (2020). Hurricane Dorian (AL052019), 24 August–7 September 2019. National Oceanographic and Atmospheric Administration. https://www.nhc.noaa.gov/data/tcr/AL052019_Dorian.pdf
- Bahamas Ministry of Public Works. (2020, August). Guide to housing standards for The Bahamas: Build Back Better. <https://drabahamas.org/web/doc/The%20Build%20Back%20Better%20Manual.pdf>
- Bahamas Ministry of Works and Utilities. (2003). Bahamas building code. (3rd ed.). <https://tinyurl.com/3fwp7yxw>
- Barker, C. J. (2019, September 12). Hampton University opens doors to Bahamian college students displaced by Dorian. *New York Amsterdam News*, 110(37), 27. <https://www.watchtheyard.com/colleges/hampton-hbcu-dorian/>
- Bleeker, A., Escribano, P., Gonzales, C., Liberati, C., & Mawby, B. (2021). Advancing gender equality in environmental migration and disaster displacement in the Caribbean. <https://repositorio.cepal.org/handle/11362/46737>
- Caribbean Disaster Emergency Response Agency. (2004). Community emergency plan: A comprehensive guide to disaster preparedness in the Caribbean. https://www.bahamas.gov.bs/wps/wcm/connect/da0c4469-ba35-4ab0-ba36-d4ed371628c1/2005-09-12_community_plan_Emergency.pdf?MOD=AJPERES
- Inter-American Development Bank & Economic Commission for Latin America and the Caribbean. (2020). Assessment of the effects and impacts of Hurricane Dorian in The Bahamas. <https://doi.org/10.18235/0002582>
- Fields, M. (2020). Resilient disaster recovery: An exploration of operationalizing climate change adaptation measures in disaster recovery at the community level on Grand Bahama and Abaco [Master's thesis, University of Lund, Sweden]. <https://lup.lub.lu.se/luur/download?func=downloadFile&recordId=9025695&fileId=9025696>
- Grand Bahamas Disaster Consultative Committee. (2018). The Grand Bahama disaster preparedness, response plan. <https://www.dloc.com/l/AA00081366/00001>
- Hughey, E. P. (2008). A longitudinal study: The impact of a comprehensive emergency management system on disaster response in the commonwealth of the Bahamas [Doctoral dissertation, University of South Florida]. <https://core.ac.uk/reader/154465900>
- Maycock, D. (2020, July 7). University staff's fears over Grand Bahama campus. *The Tribune*. <http://www.tribune242.com/news/2020/jul/08/university-staffs-fears-over-grand-bahama-campus-f/>

- National Emergency Management Agency. (2006). Hurricane guide. <https://photos.state.gov/libraries/bahamas/8325/pdf/hurricaneguide.pdf>
- National Emergency Management Agency. (2011). Hurricane and tropical storm watches and warnings. https://www.bahamas.gov.bs/wps/wcm/connect/7c970dd3-9de2-4a57-bb03-5318f499db43/NEMA_Hurricane+or+Tropical+Storm+Watches+and+Warnings.pdf?MOD=AJPERES
- National Emergency Management Agency. (2018). National disaster plan & instructions for emergency situations, 2018-2020. (Not available online)
- Office of the Prime Minister Grand Bahama. (2020, September 2). Rebuilding Grand Bahama one year post Hurricane Dorian [Press release]. <https://tinyurl.com/2y9s6kcd>
- Thomas, A., Baptiste, A., Martyr-Koller, R., Pringle, P., & Rhiney, K. (2020). Climate change and small island developing states. *Annual Review Environmental Resources*, 45, 6-1. <https://doi.org/10.1146/annurev-environ-012320-083355>
- University of The Bahamas. (2019). Strategic plan: Securing a foundation for the university. <https://www.ub.edu.bs/media/ub-strategic-plan-2019-2024.pdf>
- University of The Bahamas, Office of University Relations. (2020). Development reporter. <https://www.ub.edu.bs/wp-content/uploads/2016/12/THE-DEVELOPMENT-REPORTER-2020-final-12-7-20.pdf>
- University of The Bahamas-North, Emergency Management Response Team. (2021). Hurricane & severe weather procedures manual, 2021. <https://dloc.com/l/AA00081318>
- van der Hucht, L. E., Hoogervorst, C. D., Storm, P., Grgic, P., Ortiz, F., & Özdemir, T. (2020). Grand Bahama after Hurricane Dorian interdisciplinary approach to Build Back Better. <https://repository.tudelft.nl/islandora/object/uuid:88c3ed7e-bead-401a-b5d4-dcfc23ac757d/datastream/OBJ/download>

Appendix: The College of The Bahamas Emergency Response Management Policy

30713-1-06

The College of The Bahamas



Established 1974

POLICY NUMBER	2013-03-POL
TITLE OF THE POLICY	Emergency Response Management Policy
DATE OF ADOPTION	3 July, 2013
SUPERSEDES	Any Health & Safety Manual
DATE OF IMPLEMENTATION	3 July, 2013
PROJECTED DATE OF REVISION	July 2015
PURPOSE OF THE POLICY	This policy is The College's key emergency preparedness and management document and is intended as The College's guide for the safety of lives and property in emergency situations on the college campuses and sites, through effective use of institutional resources. Its objectives are to minimize or eliminate injury and trauma as well as damage to property, and to minimize disruption to normal operations of The College in emergency situations. It recognizes that field modifications might be necessary to respond most appropriately to a given emergency.
REVISION NUMBER	New/Not applicable
ACCOUNTABILITY	This policy is under the responsibility of the Director of Security and the Director Office of Health and Safety who are responsible for its implementation.
ASSOCIATED PROCEDURES	College of The Bahamas Emergency Procedures; College of The Bahamas Emergency & Safety Information
RELATED POLICIES	Crisis Communications Policy
HISTORY	Practices but no policy

1. AUTHORITY

This policy is established under the authority of the College Council (See Article 8. of The College of The Bahamas Act, 1995).

2. SCOPE

This Policy applies to all students, faculty, staff and visitors to all buildings and properties owned and operated by The College.

3. CLASSIFICATIONS OF EMERGENCIES

3.1 Incident: An occurrence which affects only a small part of The College community or property and does not affect the overall operations of The College. Examples include but are not limited to:

Death or illness of a person on campus, not as a result of a crime

Small localized fire that (contained to a small area and is not growing)

Isolated power outage (confined to one or two buildings or sections of building)

Small localized hazardous material spill (less than one litre and has a hazard rating below 2 in all hazard categories, that can be cleaned up by lab personnel without putting themselves or others in danger)

3.2 Major Event: a serious emergency which completely disrupts one or more operations. Examples include but are not limited to:

Bomb threat

Crimes such as assault or arson

Fire limited to one building

Civil disturbance

Widespread power outage or communication system failure

Building collapse

3.3 Crisis: A College or island wide emergency which impedes or halts the operations of The College.

Examples include but are not limited to:

Major weather event, for example, hurricane or flooding

Major fire in more than one building

Bomb

Shooting(s)

Major public health crisis

4. EMERGENCY RESPONSE AUTHORITIES

4.1 In the event of an emergency, campus response efforts will be led by the Vice President, Operations (Emergency Coordinator) who will oversee the efforts of The College's Emergency Response Team (ERT) and Area Managers.

4.2 In the case of major events or crises, the Associate Vice President, External Affairs will convene the Crisis Communication Team. Communication concerning incidents will be handled directly through the Communication Unit, Office of External Affairs as per appropriate protocols.

4.3 In the event of an emergency that reaches proportions that cannot be handled by routine measures, the President or the President's designee may declare a state of emergency.

5. COORDINATION OF EMERGENCY RESPONSE

5.1 Emergency Coordinator

5.1.1. There will be an Emergency Coordinator in both New Providence and in Grand Bahama, Both of whom shall report directly to the President in the event of an emergency.

5.1.2 Emergency Coordinators and Emergency Response Teams shall not be assigned to College properties outside of New Providence and Grand Bahama. Given the significantly smaller size of such properties and corresponding campus/site population sizes, Area Managers and alternates (see 5.4) with the support of local emergency services are considered sufficient to meet possible emergency needs.

5.1.3 The Vice President, Operations shall be the Emergency Coordinator for New Providence; the Associate Vice President, Northern Bahamas Campus shall be the Emergency Coordinator for the Northern Bahamas Campus.

5.2 Responsibilities of the Emergency Coordinator

5.2.1 Determining the type and magnitude of the emergency and establishing the appropriate emergency command centre.

5.2.2 Initiating immediate contact with the President, Associate Vice President, External Affairs and the Emergency Response Team.

5.2.3 Convening the Emergency Response Team.

5.2.4 Overall coordination of the Emergency Response Team and Area Managers.

5.2.5 Initiating assessment of The College's condition.

5.2.6 Briefing the Crisis Communication Team.

5.2.7 Notifying appropriate external organisations and emergency services and liaising with them, as would be necessary.

5.2.8 Performing other duties as may be required by virtue of the campus emergency.

5.2.9 Providing to the President information about the final outcome of the emergency.

5.3 Emergency Response Team

5.3.1 In New Providence, the Team's composition and corresponding responsibilities are as follows:

Director of Physical Plant: **1.** Coordinate appropriate contact with the Ministry of Works and related agencies as required. **2.** Coordinate appropriate contact with contractors and relevant companies engaged in capital works on College campuses, as appropriate. **3.** Coordinate appropriate response by Physical Plant Department personnel, as per their assigned areas of responsibility.

Director of Security Services: Coordinate appropriate contact with police, fire services, ambulance and related emergency response agencies as required.

Associate Vice President, External Affairs: **1.** Coordinate communication with relevant national emergency agencies for appropriate information, for the purpose of providing such information to the relevant College communities. **2.** Coordinate dissemination of appropriate information to media houses.

Director, Campus Life: Be the primary liaison between the College of The Bahamas Union of Students (COBUS) and any other relevant student groups, to ensure a timely and appropriate flow of information.

Director, Residence Life: Oversee coordination of appropriate response at The College's Residential facility, and will be responsible for ensuring that residents are kept abreast of any relevant information.

Director, Counselling and Health Services: **1.** Coordinate counselling assistance as may be required and in situations where emergency care is needed. **2.** Coordinate assistance as appropriate, including, if necessary, the notification of emergency medical services.

Chief Information Officer and Director, Information Technology: Coordinate appropriate safety, recovery and relevant technical measures as they relate to The College's information technology, and as appropriate, liaise with the Associate Vice President, External Affairs to ensure effective use of electronic communications.

Vice President, Finance & Chief Financial Officer: Coordinate timely access to funding as may be necessary.

Council Secretary: As appropriate, be responsible for the timely dissemination of relevant reporting to Council members.

5.3.2 In Grand Bahama, the Team's composition and corresponding responsibilities are as follows:

Security Officer: These duties will be assigned to the individual responsible for security on the Campus. Coordinate appropriate contact with police, fire services, ambulance and related emergency response agencies as required. Also perform duties as assigned to Area Managers (see 5.4).

Physical Plant Officer: 1. Coordinate appropriate response as it relates to securing, repairing, stabilizing and such activity involving the physical property and as per assigned areas of responsibility of Physical Plant personnel, including relevant coordination with any external contractors or similar capital project companies. 2. Perform duties as assigned to Area Managers (see 5.4).

Office of Information Technology Supervisor: Coordinate appropriate safety, recovery and relevant technical measures as they relate to The College's information technology and as appropriate, liaise with the CIO and Director to ensure safety and effective use of equipment

Librarian: Oversee coordination of appropriate response at the Library. Perform duties as assigned to Area Managers (see 5.4).

5.4 Emergency Command Centre

When an emergency occurs or is imminent, the Emergency Coordinator will establish the Command Centre based on the nature of the emergency in the George Morley Suite of the Michael H. Eldon Complex or in the alternate the Boardroom at Culinary & Hospitality Management Institute (CHMI)

In Grand Bahama, the Centre will be located at an appropriate space identified by the AVP, Northern Bahamas Campus.

Such establishment shall include: determination of the equipment necessary to render the Centre satisfactorily operational; and the assignment of staff and deployment of vehicles as needed. Campus security personnel should be placed at the scene of the emergency and at least one security officer should be posted at the Command Centre at all times during an emergency.

Command Centre equipment and supplies might include:

- Barricades, barrier tape and signs for the scene
- Portable two way radios
- Portable public address system
- Safety and medical supplies
- Campus maps and building floor plans
- Campus and local telephone directories
- Direct telephone line
- Portable computing and internet access

5.5 Area Managers

Area Managers, assisted by Emergency Wardens, have four primary responsibilities:

1. Informing the relevant authority of the emergency and its location
2. Informing all area constituents of the emergency.
3. Ceasing all operations and/or facilitating an orderly evacuation of their assigned area, if required by the ERT.
4. Conducting a post evacuation headcount and reporting to the Command Centre or a designated ERT member, as needed.

5.5.1 Area Manager Assignments:

Area Managers as outlined in this policy are assigned to designated areas. In the case of evacuation, each area will include a designated assembly point. Assembly areas should be no less than 500 feet away from the affected emergency area. Assignees, respective areas and assembly points are indicated in the Emergency Response Management Area Manager Assignments document (See Appendix C).

5.6 Emergency Wardens

Emergency Wardens are assigned to designated areas and are to assist the Area Managers. Their duties include:

1. Assisting persons as needed in an emergency
2. Inspecting emergency equipment
3. Checking emergency exit doors and routes, for their designated area, ensuring that they are unobstructed
4. Making final sweep of the designated area and reporting results to the Area Manager
6. Other Core Responsibilities

6.1 Emergency Response Team

The two principle areas around which the Team's response should be guided are damage control and campus safety.

- 6.1.1 Damage Control:** The Director, Physical Plant, with assistance from the Vice President, Operations, is the lead person for coordination of the following: ensuring the provision of equipment and personnel to perform shutdown procedures, hazardous area control, barricades, damage assessment, debris clearance, emergency repairs and equipment

protection.

Ensuring the provision of vehicles, equipment and operators for movement of personnel and supplies, and assignment of vehicles to the Emergency Response Team, as required for emergency use.

Obtaining the assistance of utility companies as required for emergency operations.

Ensuring the provision of emergency power and lighting systems as required.

Surveying habitable space and relocation of essential services and functions.

Ensuring the provision of facilities for emergency regenerator fuel during actual emergency or disaster periods.

Coordinating with area managers for liaison and necessary support.

6.1.2 Campus Safety: The Director of Security with the assistance of Director of Health & Safety, and as appropriate, the assistance of the Director, Counselling & Health Services or his/her designee is the lead person for coordination of the following, as circumstances might dictate:

Maintaining safety and securing offices and relevant outposts in a state of constant readiness

Notifying the President, Emergency Coordinator and Associate Vice President, External Affairs of major incidents and emergencies

Monitoring campus emergency warning and evacuation systems

Taking immediate and appropriate action to protect life and property, and to safeguard records as necessary

Obtaining assistance from external officials for health and related service monitoring and first aid as needed

Providing traffic control, access control, perimeter and internal security patrols and fire prevention services as required

Providing and equipping an alternate site for the Emergency Command Centre

Liaising with the Director, Information Technology to ensure telecommunications support as necessary

6.2 Faculty and Staff

Each faculty and staff supervisor is responsible for assisting Area Managers and Emergency Wardens, by informing students and/or employees, under their direct report, of the emergency condition and initiating outlined emergency procedures.

7. Notification System

7.1 For situations requiring immediate police, fire or medical response to preserve life or property, external emergency services should be notified immediately, by dialling 919 or 911, followed by notification to Campus Security at Security Control room ext. 4566. If the emergency occurs on the Northern Bahamas Campus, the AVP shall be informed immediately after the relevant external agency has been notified.

7.2 For other situations, Campus Security may be notified in the first instance.

7.3 Upon notification to Campus Security, the officer on duty receiving the information shall notify the Director of Security, who shall inform both the Emergency Coordinator and the Associate Vice President, External Affairs.

7.4 If the emergency involves a student, the Vice President Student Affairs shall also be informed.

7.5 The Emergency Coordinator shall determine the type and magnitude of the emergency and depending on same will proceed as per the relevant Emergency Response Management guidelines

We were especially impacted at our UB-North campus, which suffered severe damage and loss. It highlighted our need to prepare differently for storms in this era of climate change, and that we must feverishly work on increasing our student housing capacity, as we have had to accommodate many of the students displaced. It also taught us that we have many friends at home and abroad who are willing to step in and provide genuine help when we are in need.

Dr. Rodney D. Smith
Friday, 18th October 2019
Third Annual Opening Convocation

Office of The President

Telephone: (242) 302-4400

