

2017/2018 HURRICANE SEASON

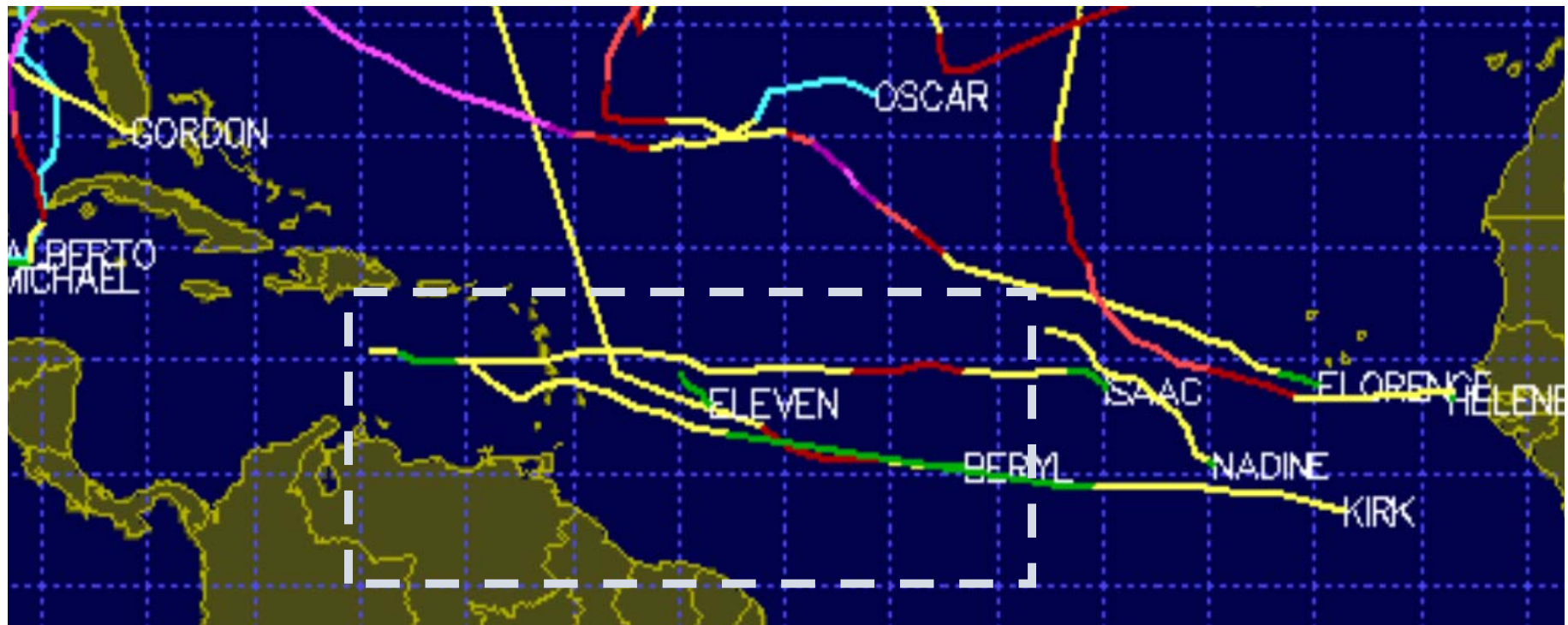
LESSONS LEARNED



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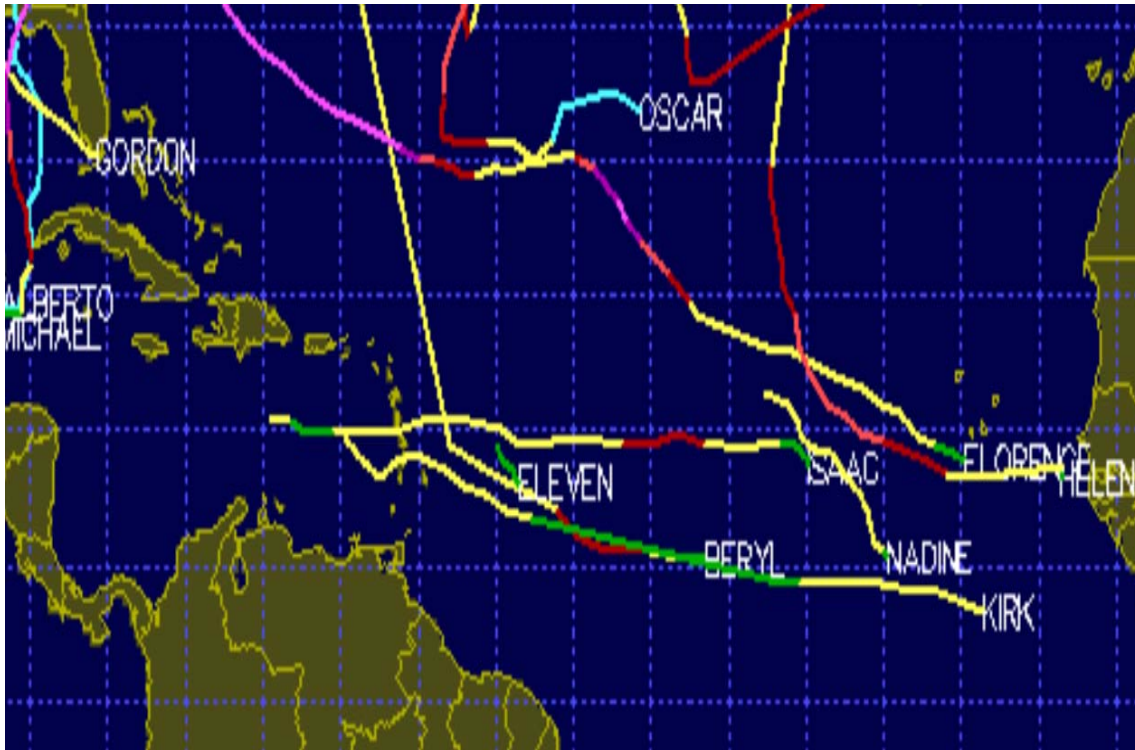
TROPICAL CYCLONES IN THE PIARCO FIR - 2018



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TROPICAL CYCLONES IN THE PIARCO FIR - 2018



- 16 Storms in the Atlantic
- Piarco UTA/CTA continental sectors were impacted by three major systems.
- Not much disruption to ATC services. One system caused closures to several airports and TMAs



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TROPICAL CYCLONE IMPACT 2018

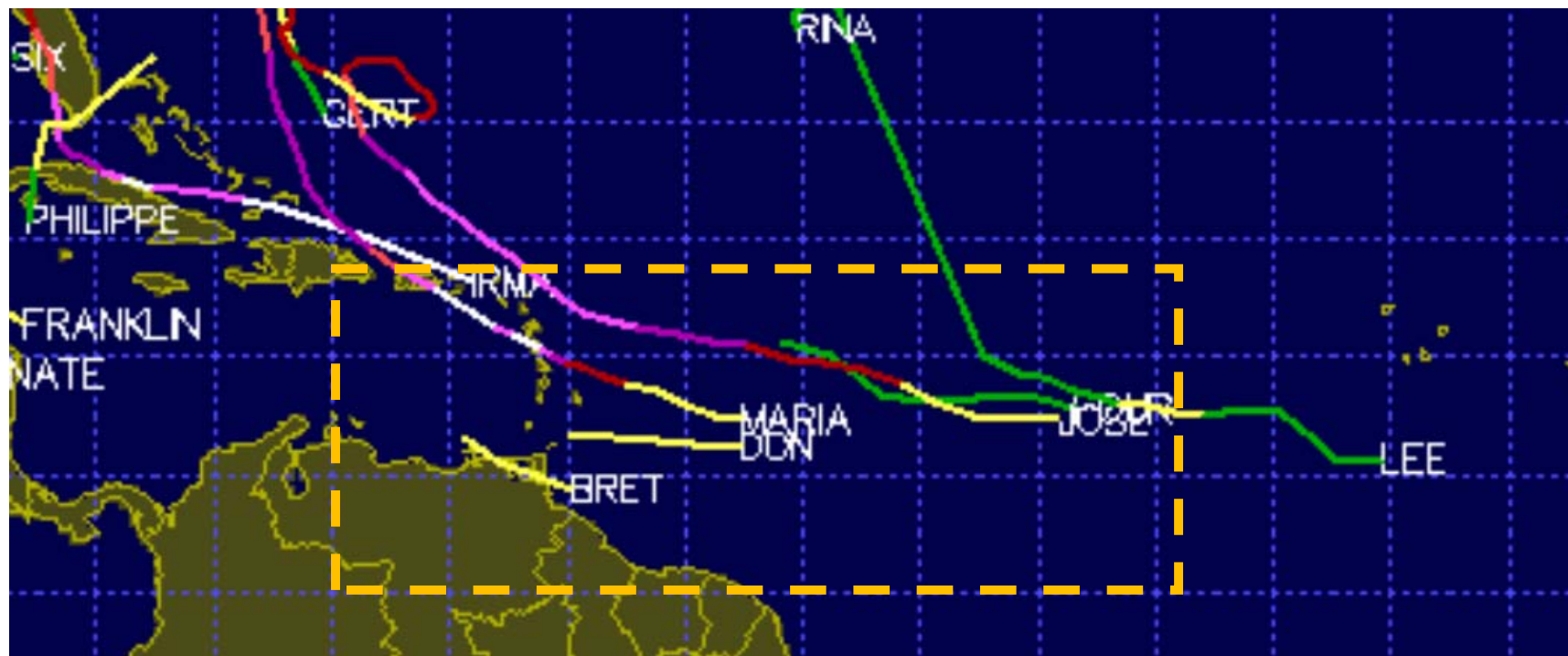
NAME	PERIOD	IMPACT
TS BERYL	July 8-10	<ul style="list-style-type: none"> • No Major Impact • Re-routes Around System • Increased Demand In Oceanic Sector Due To Deviations
TS ISAAC	SEP 13 - 14	<ul style="list-style-type: none"> • TFFR – AIS and ATS services suspended; and aerodrome closed Sept 13 - 14. airspace downgraded to Class G. • TFFF - AIS and ATS services suspended; and aerodrome closed until Sept 13 - 14. Airspace downgraded to Class G. • TDPD, TDCF closed due to passage of Trop Storm ISAAC until sept 12 - 14 • Piarco ACC Freq. 126.5 MHz, 133.1 MHz and 124.0 MHz were withdrawn off high sites at TLPL, TBPB, and TAPA; until Sept 12 - 15. Communications Capabilities reduced in North Sectors
TS KIRK	SEP 27 - 29	Weak Storm, no major impact



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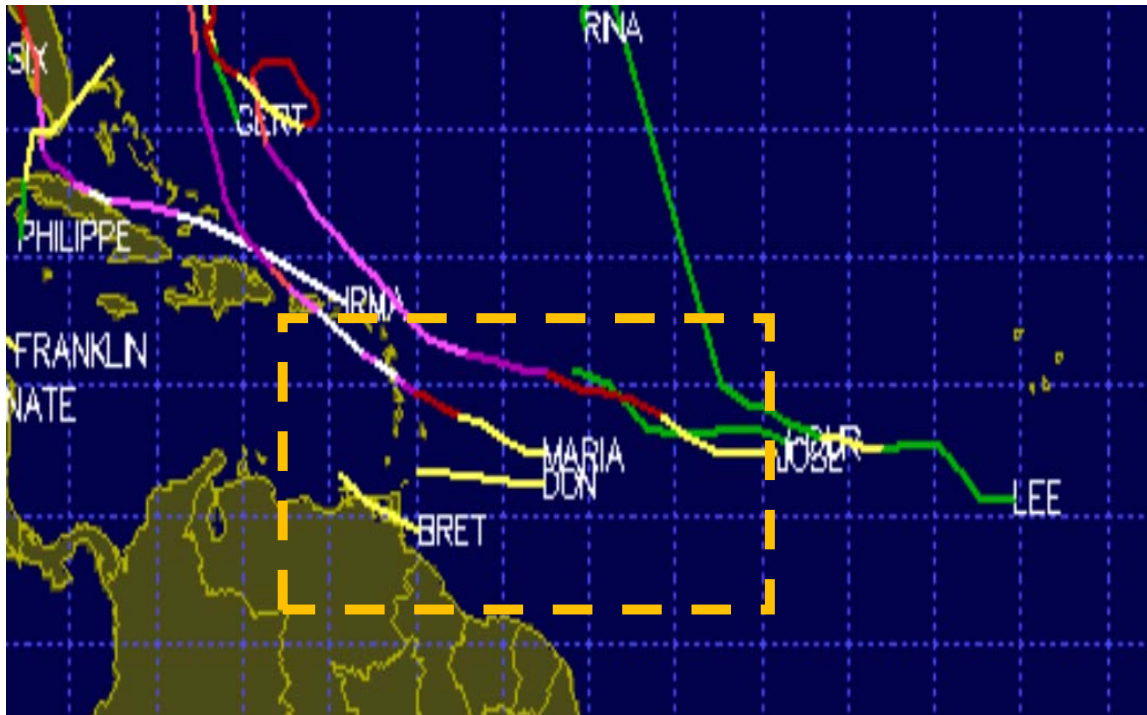
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TROPICAL CYCLONES IN THE PIARCO FIR - 2017



- 19 Named Storms in the Atlantic
- Piarco UTA/CTA was impacted by six major systems:
- Three of these storms resulted in major disruption to ATC



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TROPICAL CYCLONE IMPACT 2017

NAME	PERIOD	IMPACT
TS DON	JUN 17 -18	<ul style="list-style-type: none"> • No Sig Impact • Unusual path south of normal system trajectories
TS BRET	JUN 19-21	<ul style="list-style-type: none"> • TTCP, AD Closed Jun 19 – Jun 20, 1000z • TGPY, AD and TMA closed June 20 0000Z – 1600Z • Unusual path on south of normal trajectory. TTCAA had to consider possible damage to assets on the islands of Trinidad and Tobago; damage to ACC that could reduce ATC capabilities in the FIR
TS HARVEY (WEAK STORM IN TTZP FIR)	AUG 17 - 18	<ul style="list-style-type: none"> • No Sig Impact
HURRICANE JOSE	SEP 06-10	<ul style="list-style-type: none"> • No Sig Impact • Increased demand in various sectors due to reroutes around storm



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TROPICAL CYCLONE IMPACT 2017

NAME	PERIOD	IMPACT
HURRICANE IRMA	Sept 3 - 6	<ul style="list-style-type: none"> • TAPA closed Sept 5-7 • TKPK closed Sept 5-8 • TFFR AD AND TMA CLOSED SEPT 5-6 • TNCM CLOSED SEPT 5 – RE-OPENED OCT 17 (SEVERLY IMPACTED) • ALL VHF SITES, FOR PIARCO FREQUENCIES WERE WITHDRAWN IN ANTIGUA RESULTING IN LIMITED VHF COVERAGE IN NORTHSECTORS.
Hurricane Maria	Sept 18-19	<ul style="list-style-type: none"> • ST. LUCIA TLPL/TLPC CLOSED SEPT 18-19 • TFFF CLOSED SEPT 18-19 (AD AND TMA) • TFFR CLOSED SEPT 18-19 (AD AND TMA) • TAPA CLOSED SEPT 18-20 (AD AND TMA). STILL RECOVERING FROM IRMA • TNCM STILL CLOSED AND RECOVERING FROM IRMA • Major impact to TJZS FIR



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LESSONS LEARNED FROM 2017 AND 2018 SEASON

1. When should a CADENA Web-Conference be convened for a tropical cyclone:

- Web Conference should be convened no more than twenty-four hours prior to the system making land-fall in the Eastern Caribbean as most of the TMA ANSPs normally make decisions within that period.

2. Surveillance Redundancy:

- Possible of loss of RADAR Surveillance. TTCAA has embarked on a project to install ground ADS-B receivers throughout the Eastern Caribbean, which would provide redundancy in case of SSR damage.

3. Restoration of VHF Communications

- In the wake of Hurricane Irma in 2017, roads that led to the VHF high-sites in Antigua were severely damaged making it difficult for technical crew to reach the sites to restore communications. Due to reduced communications, Piarco requested that New York issued Oceanic Clearances for Transatlantic Flights.



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LESSONS LEARNED FROM 2017 AND 2018 SEASON

4. ATC has to consider that Air traffic demand is more than normal after the passage of a tropical cyclone due to the following factors:

- Some airlines operate extra flights to compensate for the cancellations caused by the closure of major airports
- Large number of Humanitarian Flights operations
- Aircraft deviations around storm in adjacent airspace, into the Piarco FIR

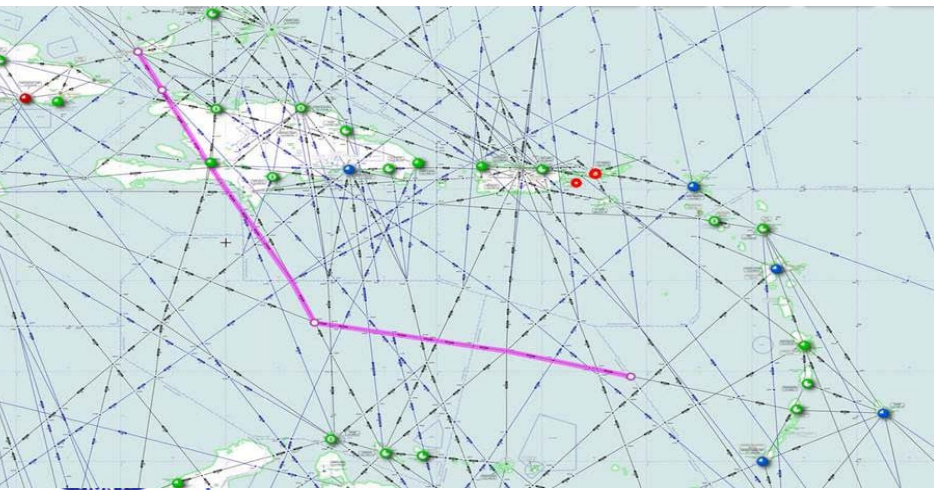
Lessons Learned – Reduced ATC Capabilities TJZS due to Maria

The following route options were coordinated between the relevant FIRs and were, offered to and utilized by, flights to and from the Piarco FIR. Routes can be used again for similar situations.

1. Re-Route Option 1

(BOGSI UA511 PENKO UA315 JOSE)

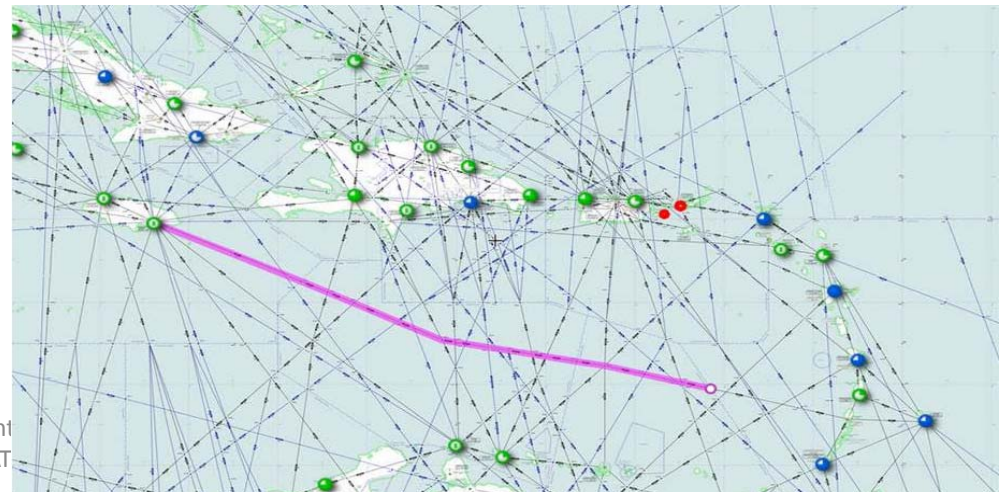
Required coordination with Maiquetia and Dominican Republic



2. Re-Route Option 2

(BOGSI UA511 MLY....)

Required coordination with Maiquetia and Kingston



Lessons Learned – Reduced ATC Capabilities TJZS due to Maria



3. Re-Route Option 3 – for appropriately ETOPS certified flights with destination on the Eastern Seaboard USA
(CITRS ZABOR L462 TARMO L462....north and southbound)
Required coordination with New York Center, Oceanic Sector.



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Lessons Learned - CADENA RIG CDM process

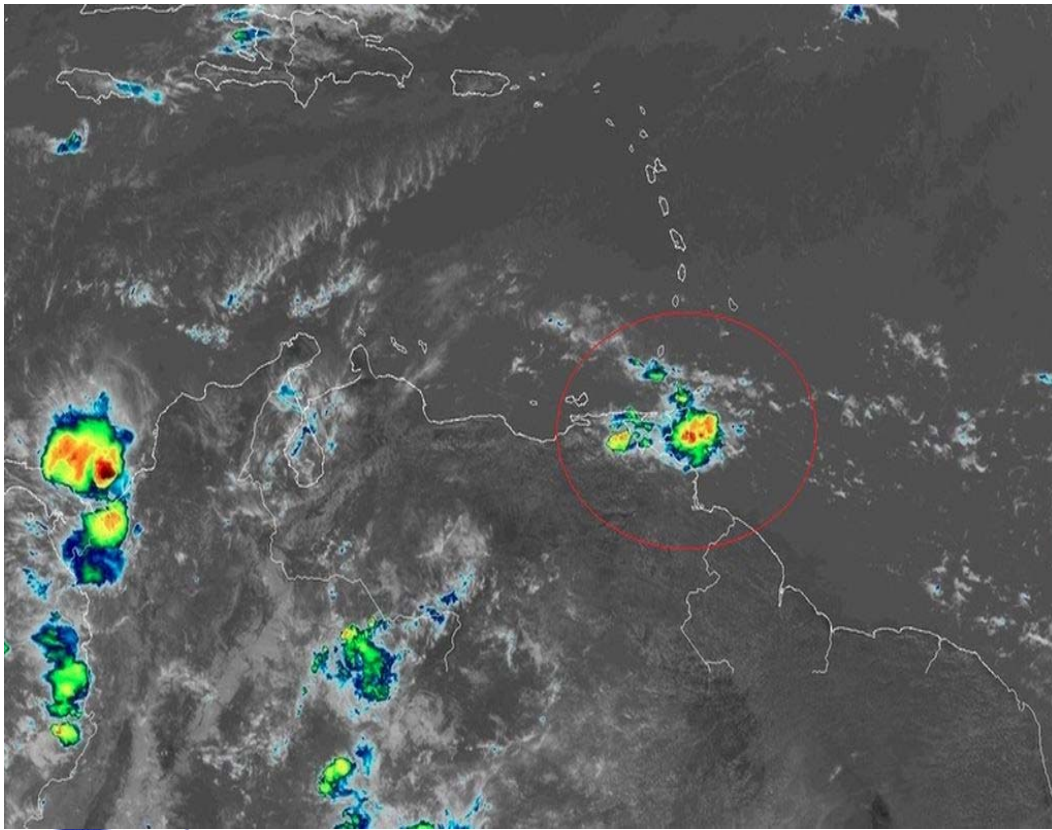
- The CADENA CDM process was extremely vital during the 2017 and 2018 season as it enable the quick dissemination of operational information through the Hurricane telecons and CADENA OIS.
- Through the CDM process ANSPs/FMUs acquired Points of Contact information that they were able to use to disseminate important operational information in near real time, via emails and phone.
- Reduced the workload on the ATCOs as the CDM process allowed planning to be executed at the strategic and pre-tactical phase.



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IMPACT OF INTER TROPICAL CONVERGENCE ZONE (ITCZ)



OCT 2018 - ITCZ

- An active Intertropical Convergence Zone (ITCZ) produced prolonged periods of thunderstorm activity over Trinidad and Tobago over a period of 7 days, leading to widespread severe flash flooding and thousands of people stranded.
- The Prime Minister declared a "national disaster" and authorities responded to the event.
- Many ATC staff were unable to report for duty due to flooding at their homes and impassable roads.



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IMPACT OF THE (ITCZ)



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IMPACT OF THE (ITCZ)



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CONTINGENCIES FOR ITZC FLOODING INCIDENT

Contingencies measures included:

- Transport for available staff via TTCAA bus to ACC
- Some available ATCOs and AIM staff were airlifted by helicopter to the ACC
- TTCAA management provided meals for operational staff
- TTCAA management organized available personnel to assist staff members who were impacted by flood:
 - Help with clean-up
 - Provision of meals, etc..

CONTINGENCIES FOR ITZC FLOODING INCIDENT

- The TTCAA management organized available personnel to assist staff members who were impacted by flood:
 - Help with clean-up
 - Provision of meals, etc..
- The TTCAA management would make arrangement to secure accommodations at nearby hotels for contingency staff during future similar situations

LESSON LEARNED FROM FLOODING INCIDENT

- A severe weather event does not necessarily have to be a tropical cyclone, but can also take the form of a period of extensive rainfall over a period a many days result in flooding, landsides and other adverse situations, similar to that which is caused in during tropical cyclones.
- Contingency measures developed during this incident can be used if a tropical cyclone should make landfall over Trinidad
- Although the airport wasn't really affected, some delays were experienced as passengers had some difficulty in arriving at the airport, due to almost impassible roads, reduced public transport services, etc.
- The CADENA OIS was a valuable tool to disseminate information in real time information to the airlines during the flooding incident



Questions?

THANK
YOU