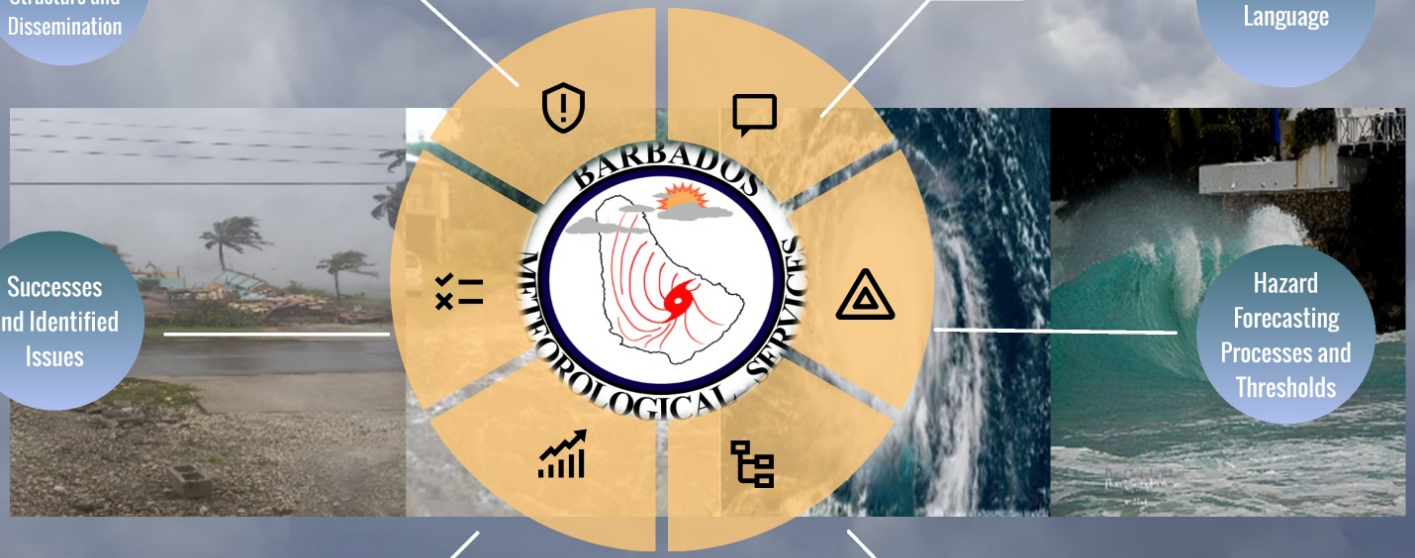
IBF IMPLEMENTATION PROCESS

Lessons Learned

63rd Caribbean Meteorological Council



November 23rd 2022

Mr. Sabu Best
Director
Barbados Meteorological Services
Barbados Permanent Representative to WMO

George Town, Cayman Islands
2022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George Town, Cayman Islands
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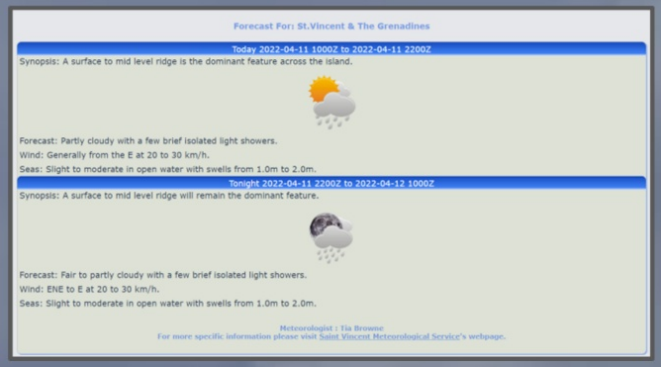
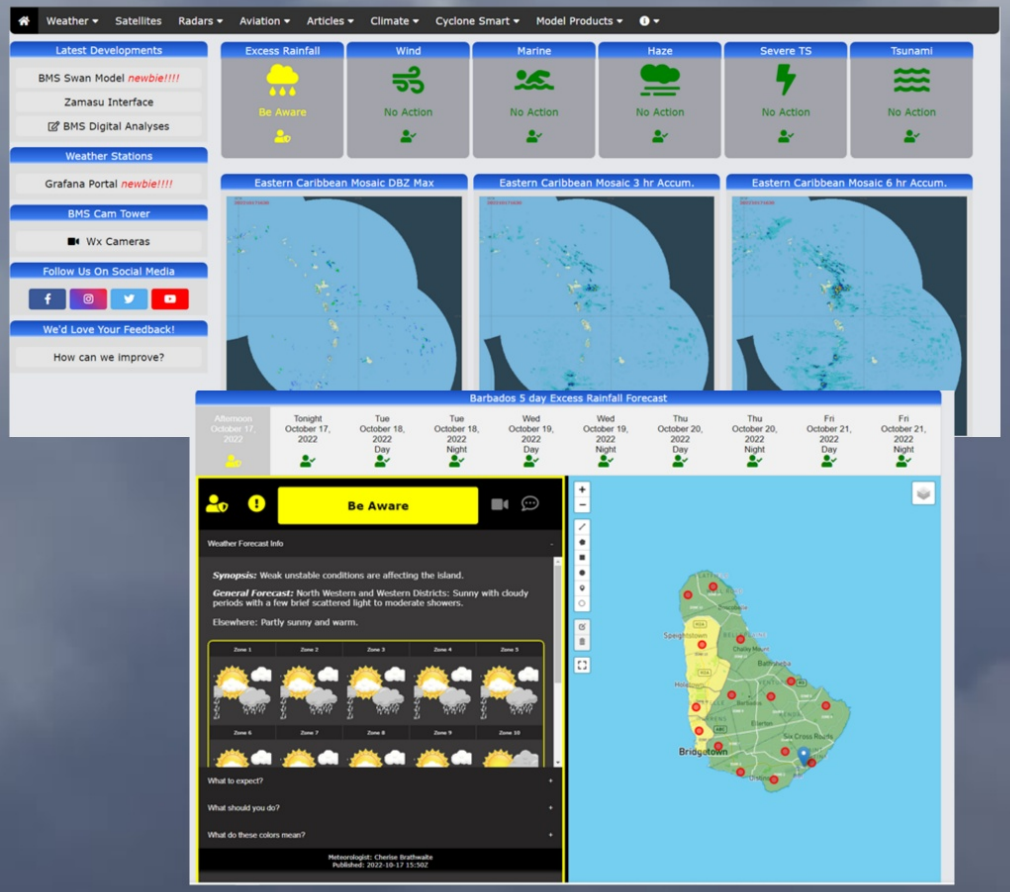
George Town, Cayman Islands

Where we were



Where we are now

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Multi-Hazard Products and Services

- Excess Rainfall
- Wind
- Marine
- Haze
- Severe Thunderstorm
- *Tsunami

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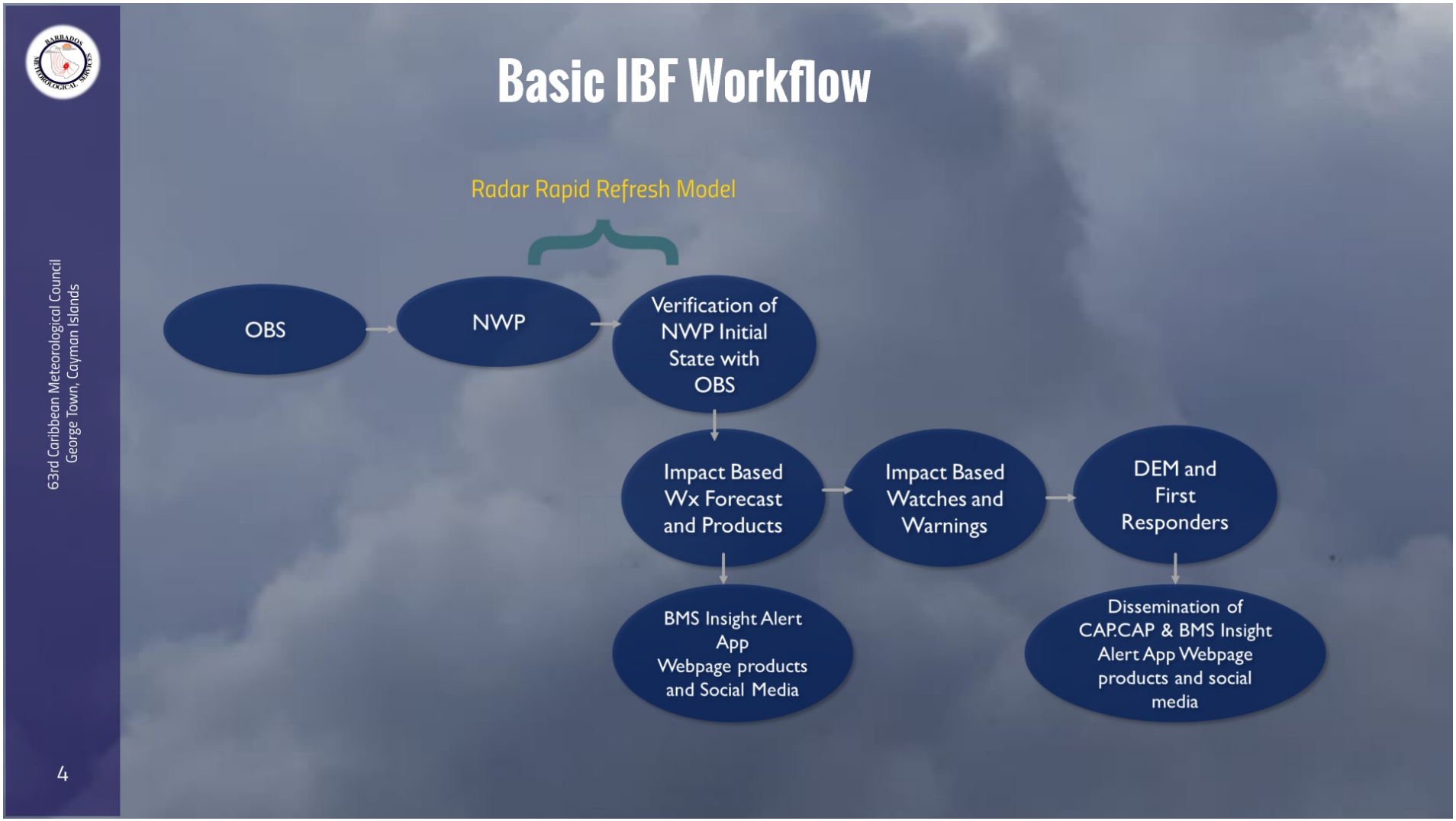
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NWP
Verification of NWP Initial State with OBS
Impact Based Wx Forecast and Products
Impact Based Watches and Warnings
DEM and First Responders
BMS Insight Alert App Webpage products and Social Media
Dissemination of CAP.CAP & BMS Insight Alert App Webpage products and social media
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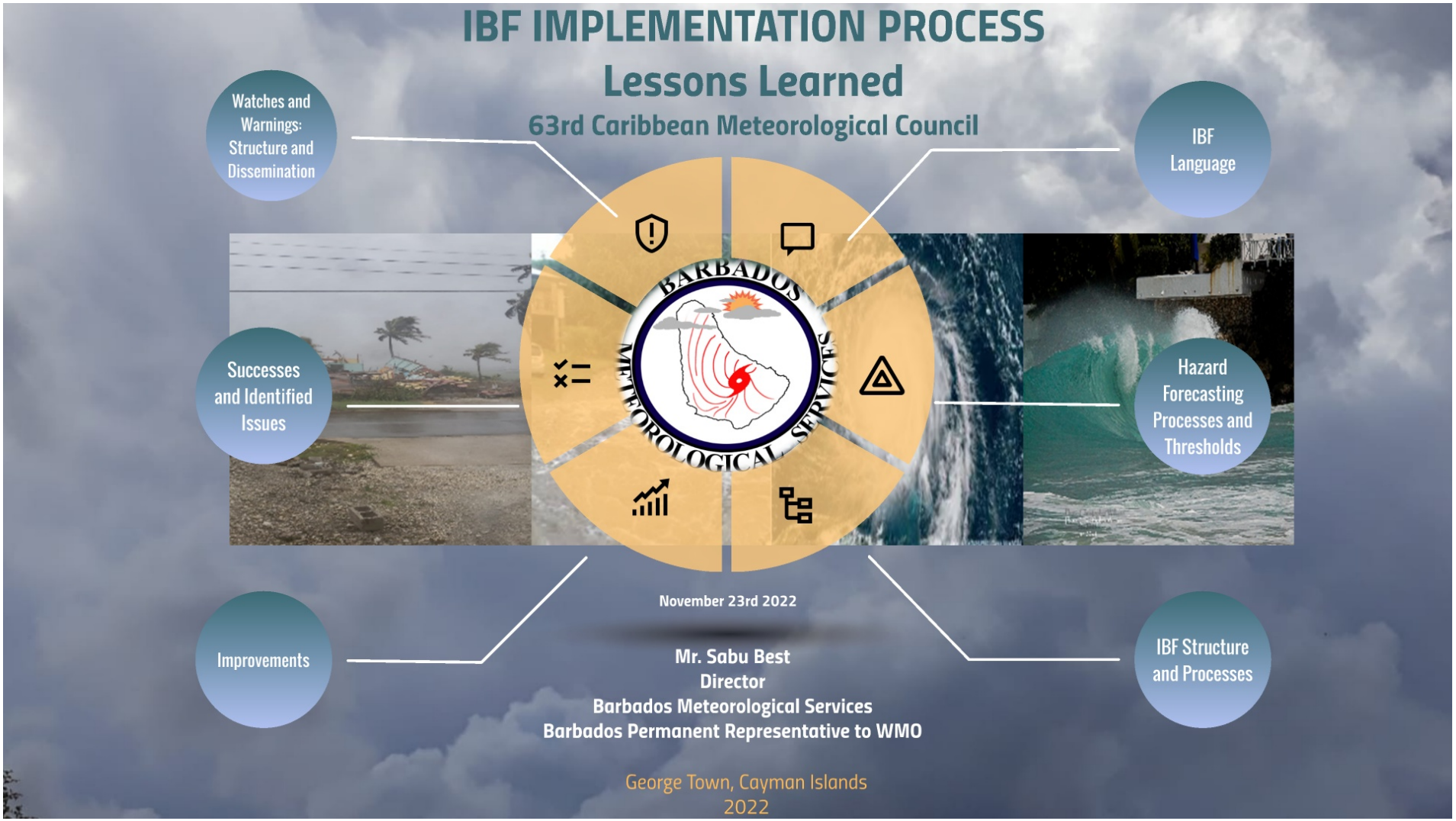
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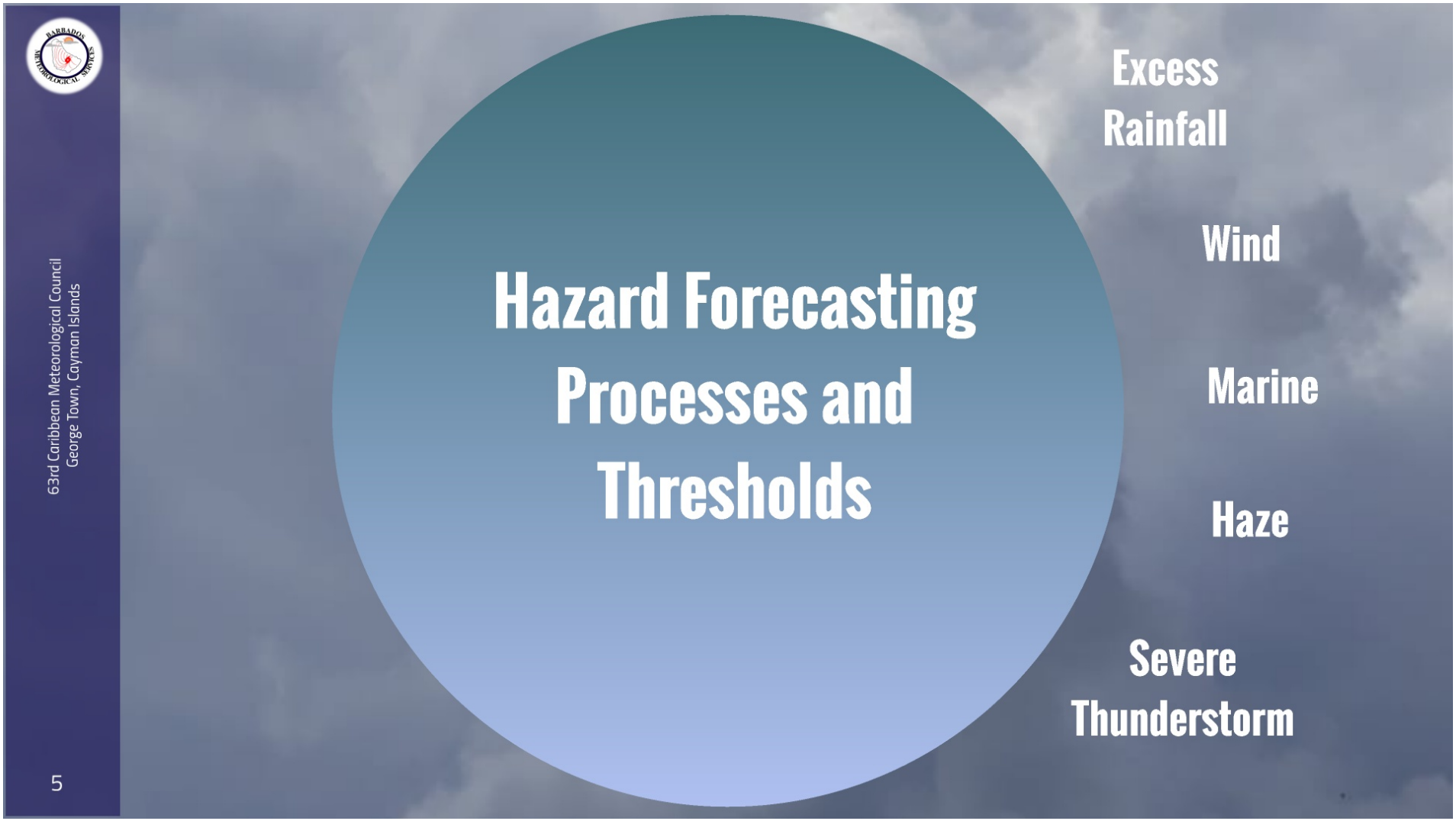
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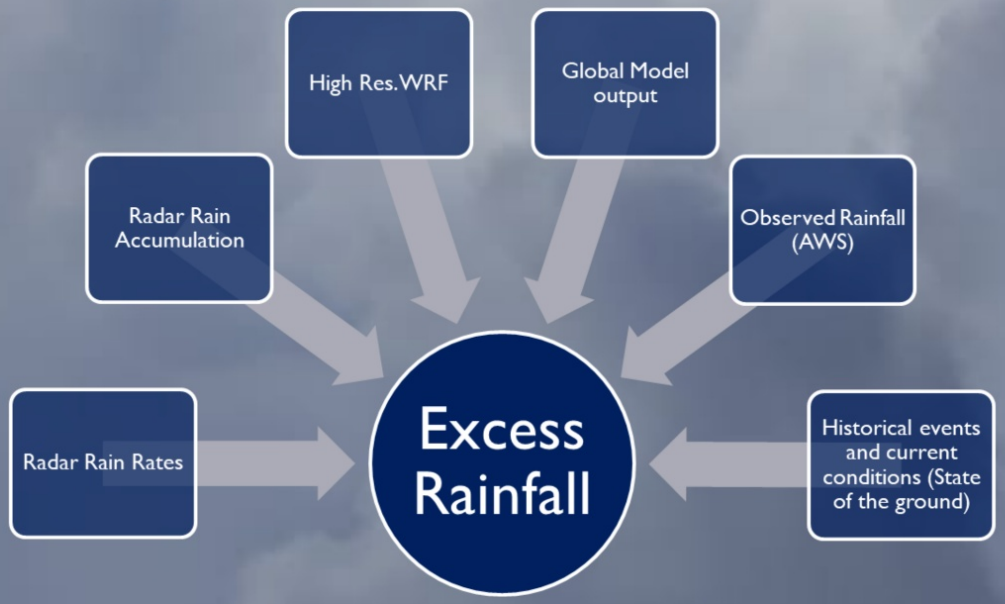
Excess Rainfall Forecasting Process



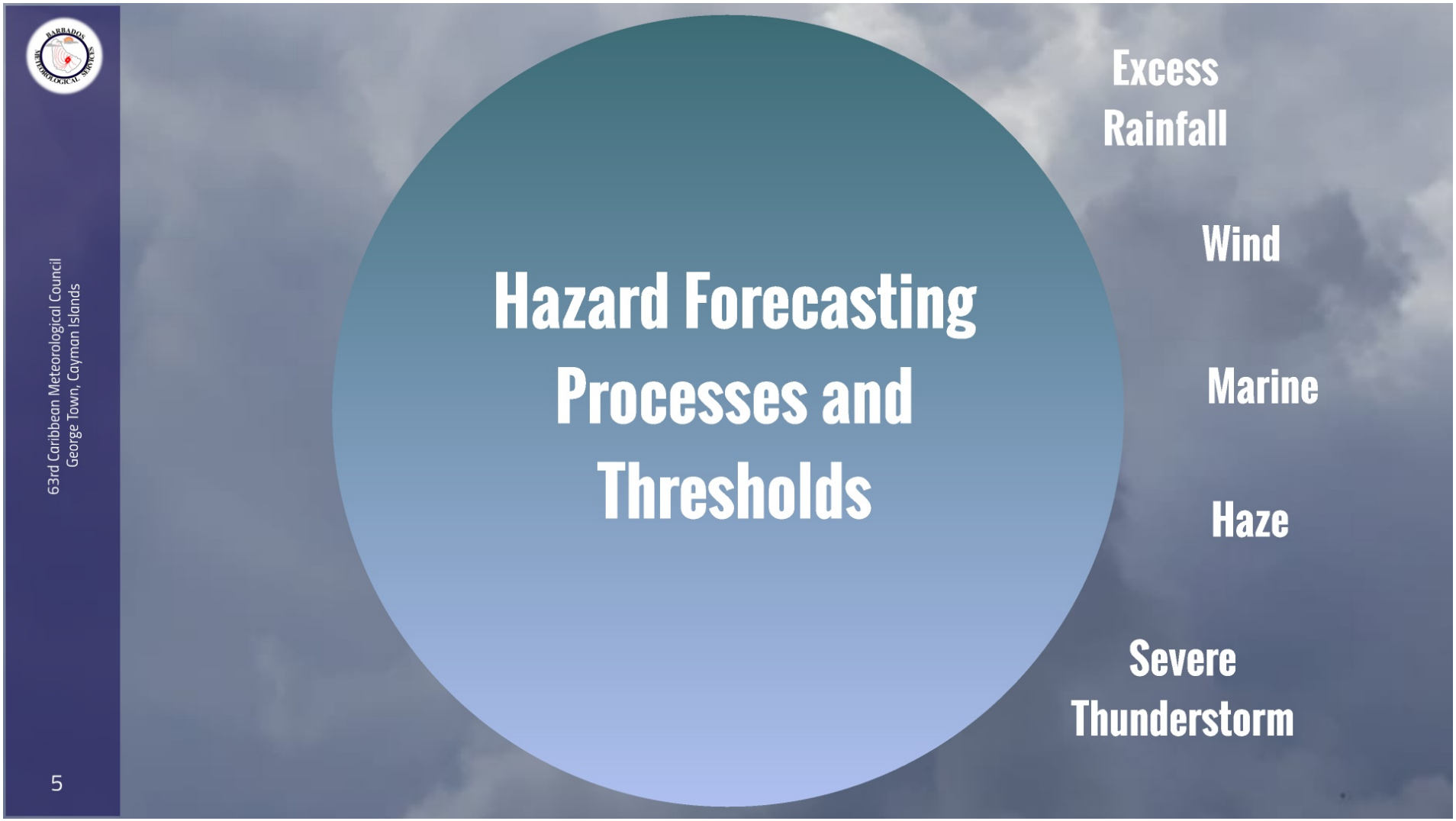
Current Thresholds

(2020 - 2022)

Hazard Level	Rain Rate
Green (Minimal)	Less than 10 mm/hr
Yellow (Minor)	20 to 29 mm/hr
Orange (Significant)	30 to 49 mm/hr
Red (Severe)	50 mm/hr and above

Forecaster Considers:

- Synoptic feature
- Forecast rainfall
- Observed rainfall generated from the feature
- Situation on the ground
- Topography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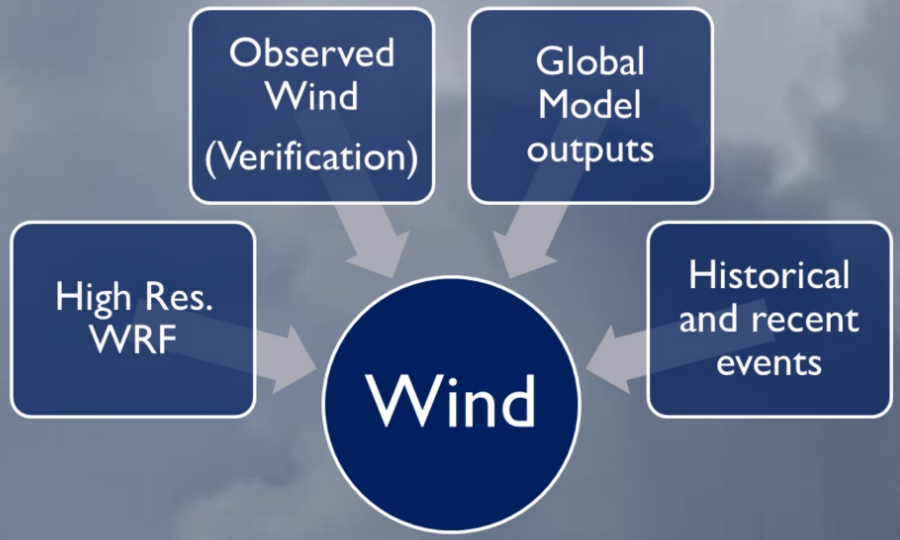
Wind Forecasting Process



Observed wind data also includes Radar VVP and Radial velocity

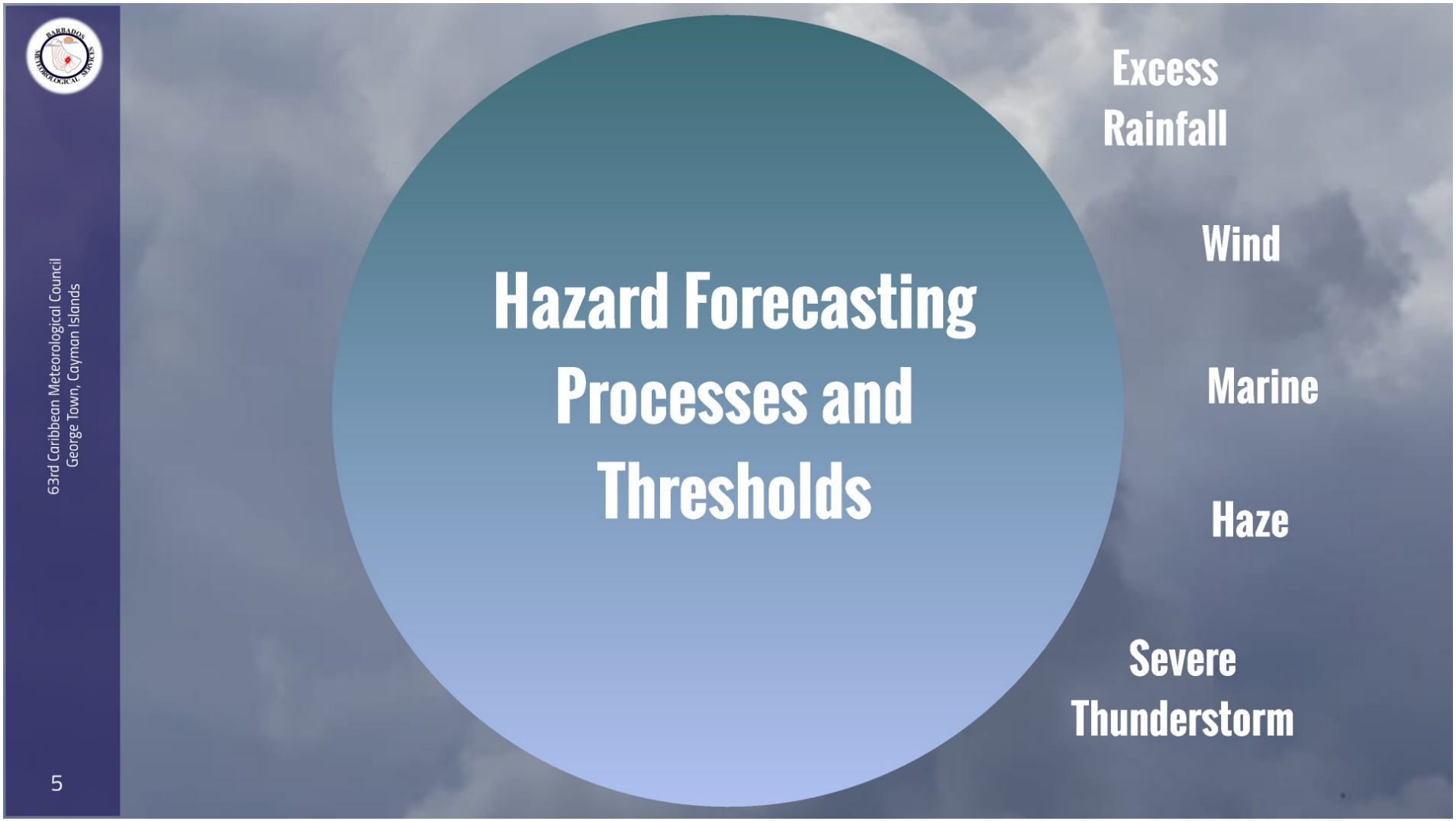
Current Thresholds

(2020 - 2022)

Hazard Level	Wind speed
Green (Minimal)	Less than 25 knots
Yellow (Minor)	25 to 29 knots
Orange (Significant)	30 to 34 knots
Red (Severe)	35kts and above

Forecaster Considers:

- Impacts from hazard
- WMO Wind thresholds
- Topography
- Coordination with DEM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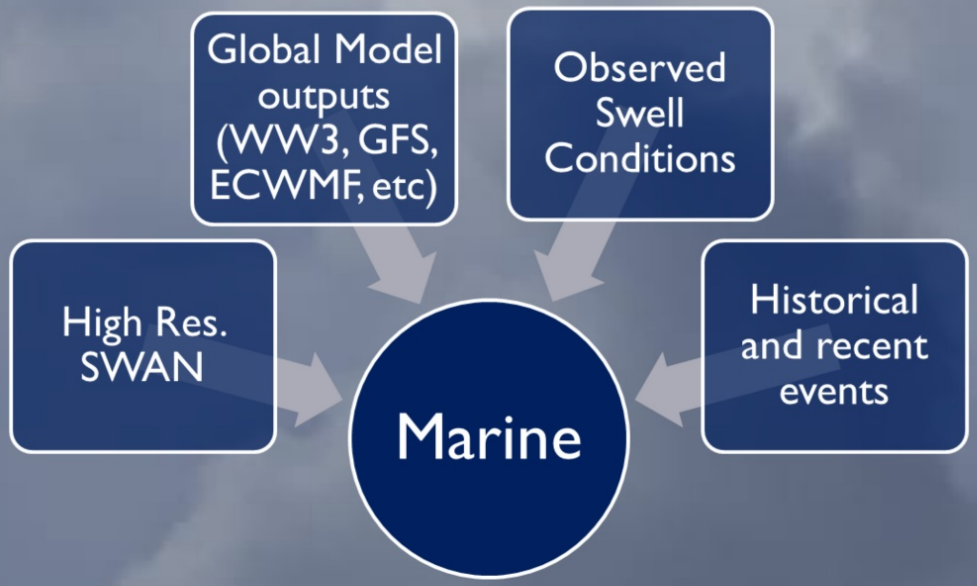
Marine Forecasting Process



Current Thresholds

(2020 - 2022)

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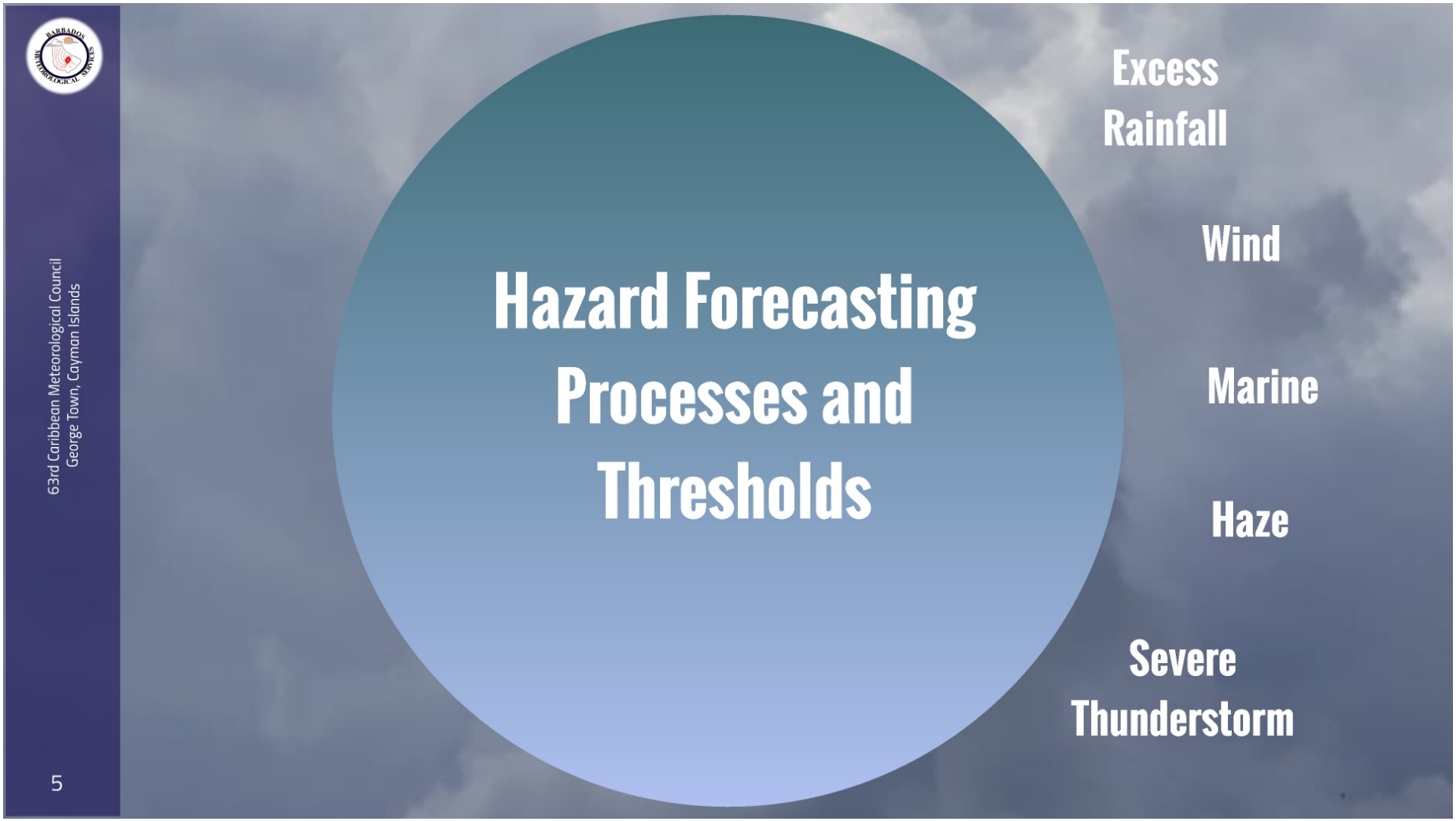
Hazard Level	Swell Heights
Green (Minimal)	2.0m and under
Yellow (Minor)	2.0m to 2.5m
Orange (Significant)	2.5m to 3.0m
Red (Severe)	3.0m and above

Forecaster Considers:

- Nearshore zones (coastline to 5km)
- Open water (beyond 5km)
- Impacts vary for western and weatern coastlines based on bathymetry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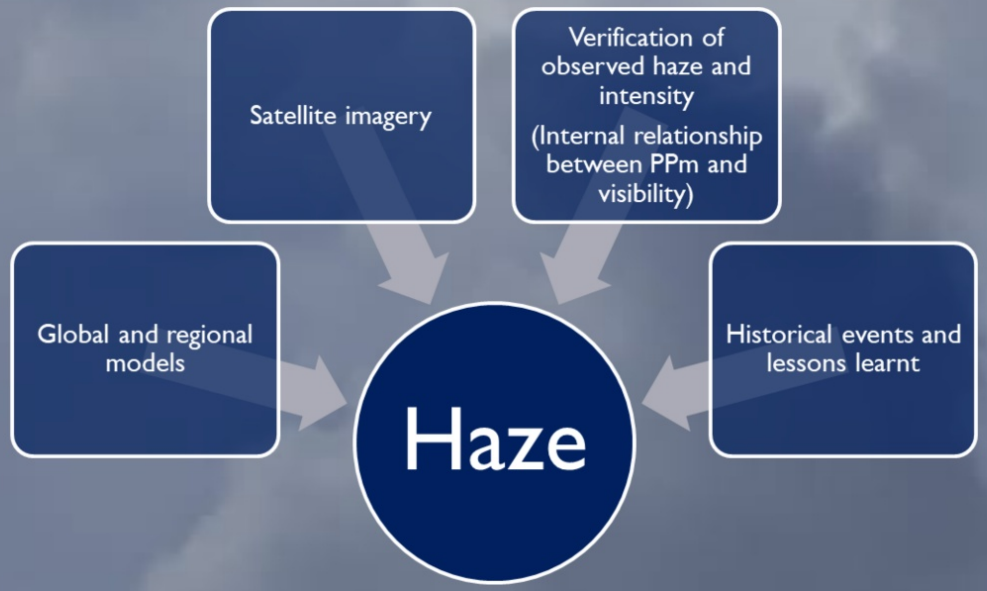
Haze Forecasting Process



Current Thresholds

(2020 - 2022)

Hazard Level	Visibility
Green (Minimal)	25km and above
Yellow (Minor)	15km to 20 km
Orange (Significant)	10 km
Red (Severe)	5km and less

Forecaster Considers:

- Visibility
- Haze intensity

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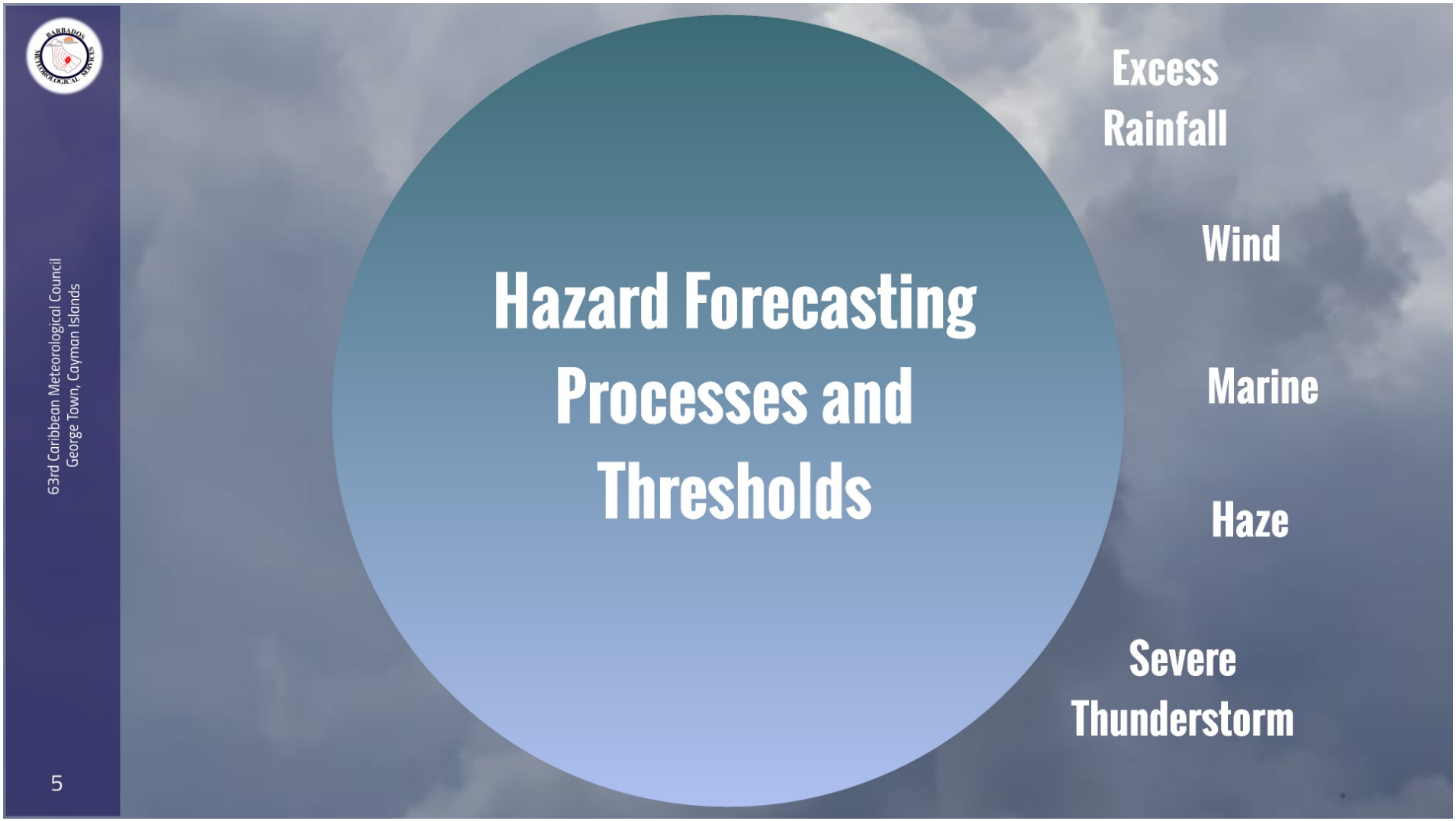
George Town, Cayman Islands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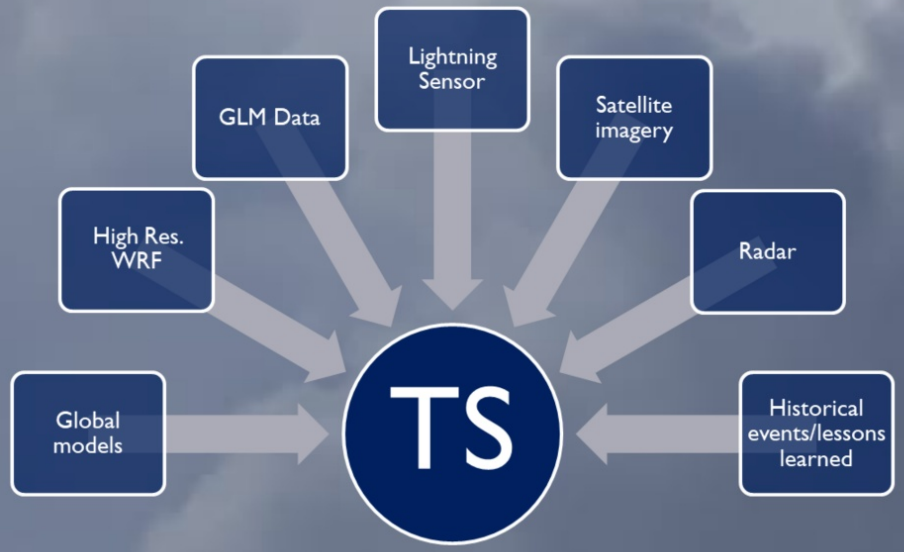
Severe TS Forecasting Process



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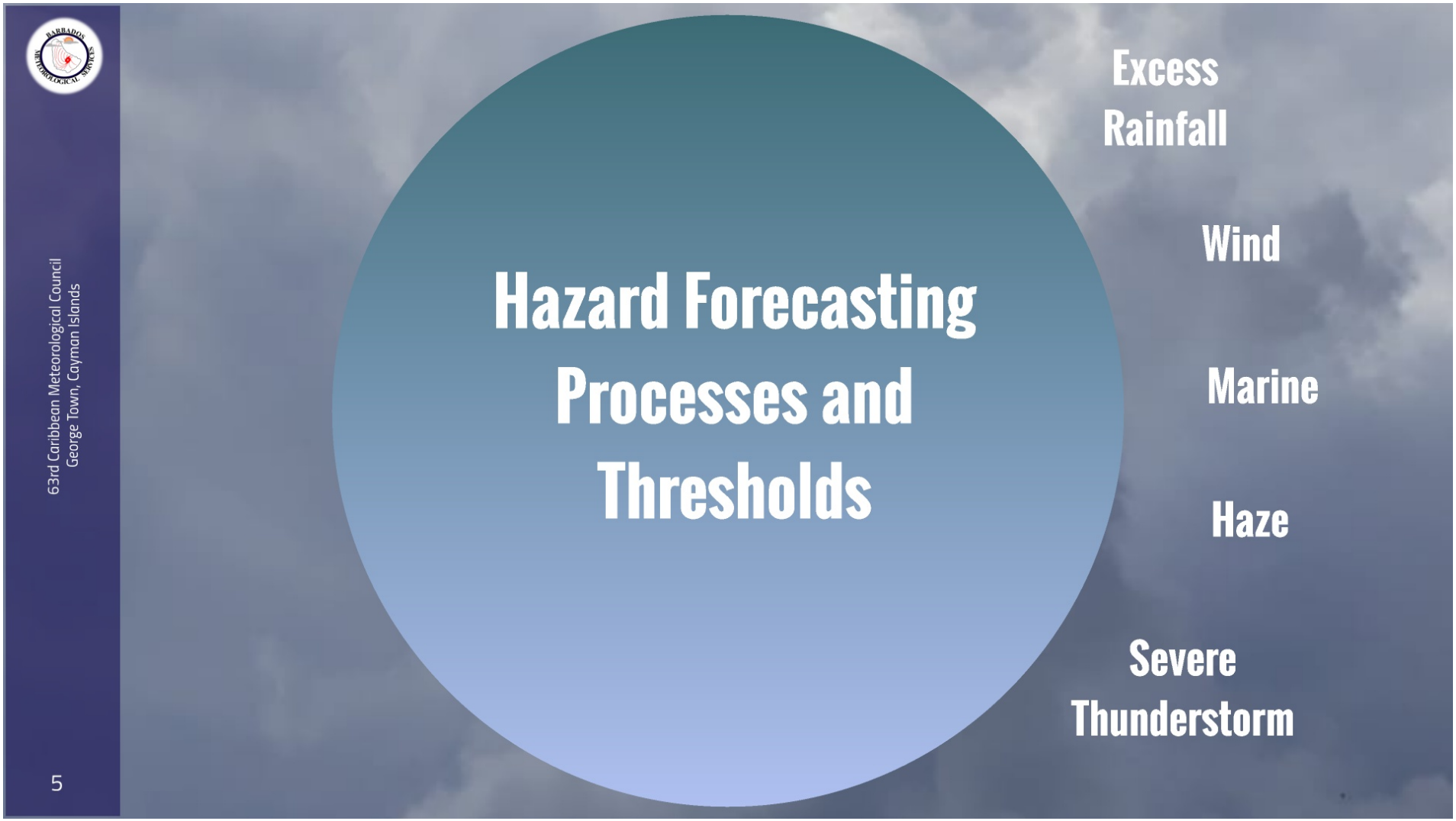
Current Thresholds

(2020 - 2022)

Hazard Level	TS Distribution
Green (Minimal)	No Thunderstorms (0%)
Yellow (Minor)	Isolated (up to 24%)
Orange (Significant)	Scattered (25 to 54%)
Red (Severe)	Widespread (at least 55%)

Forecaster Considers:

- Spatial distribution
- Intensity of convection (cloud tops, radar reflectivity)
- Atmospheric dynamics
- Assets within particular zone (e.g light & power, port)
- Time of day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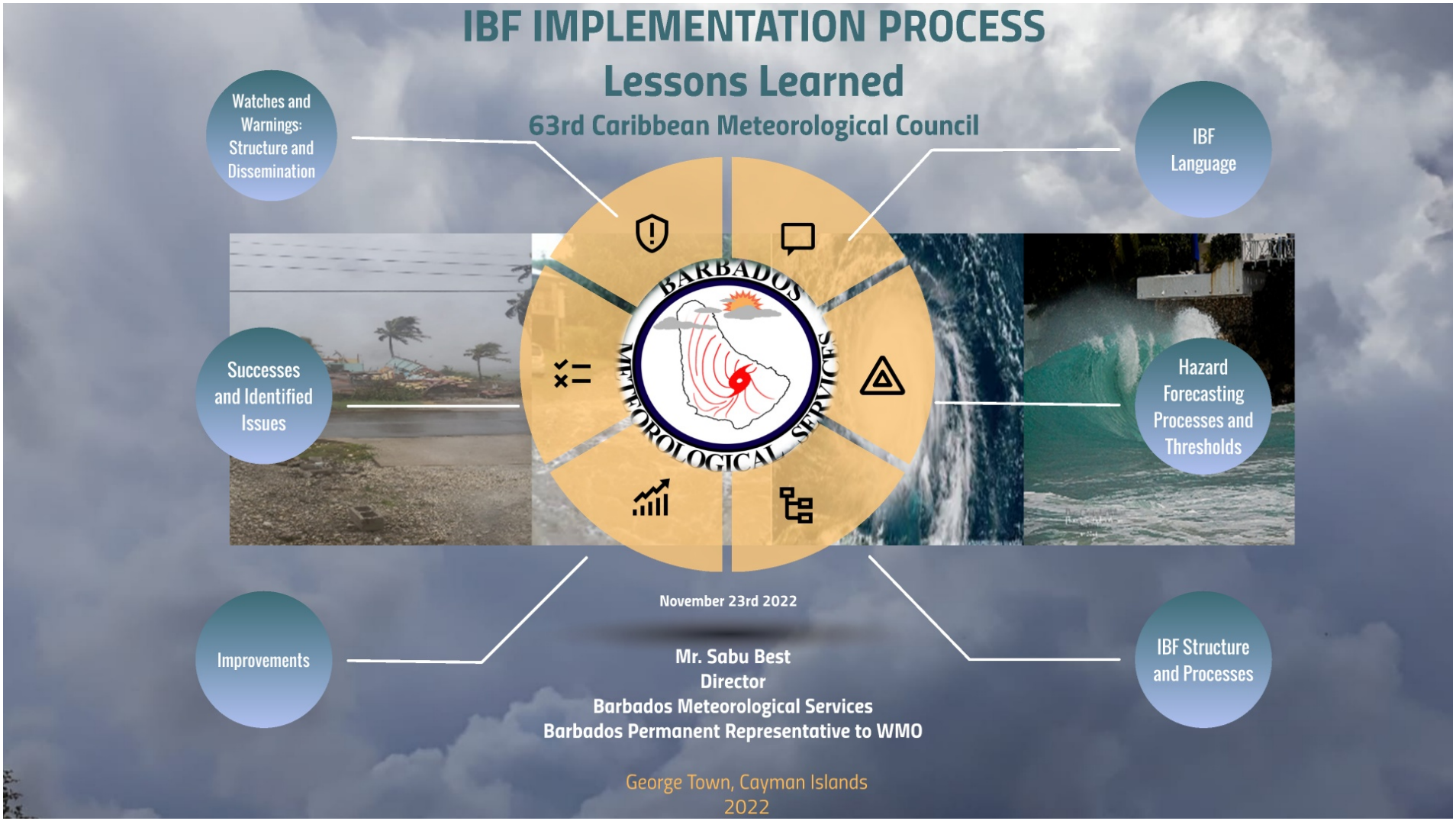
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Impacts (Rainfall)

63rd Caribbean Meteorological Council
George Town, Cayman Islands

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No response required at this time

Impact by zones
What to do?

Expect some water settlements on roads and fields along with some minor traffic delays
Minor runoff from higher elevations

Some soil erosion on bared or scarred land surfaces
Debris such as small rocks, mud and tree foliage could end up on roads and property
Significant flooding at the foot of hillsides and coastal roads is possible

Increase water levels of existing water bodies
Invasive water settlements or rushing water on roads, field and property
Possible overflowing of canals and drains

Responses (Rainfall)

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George Town, Cayman Islands

Responses by zones
What should you do?

No response required at this time

No significant response required at this time.
Persons should walk with light protection rain gear e.g. Raincoat and/or umbrellas

Travel with full protective rain gear
Monitor radio or television stations for updates from BMS,DEM
Download CAP.CAP

Start your travels well in advance to allow for significant delays. Stay off roads if you can.
Be ready to evacuate your property or work ONLY if necessary.

Predetermined language by DEM and other stakeholders.


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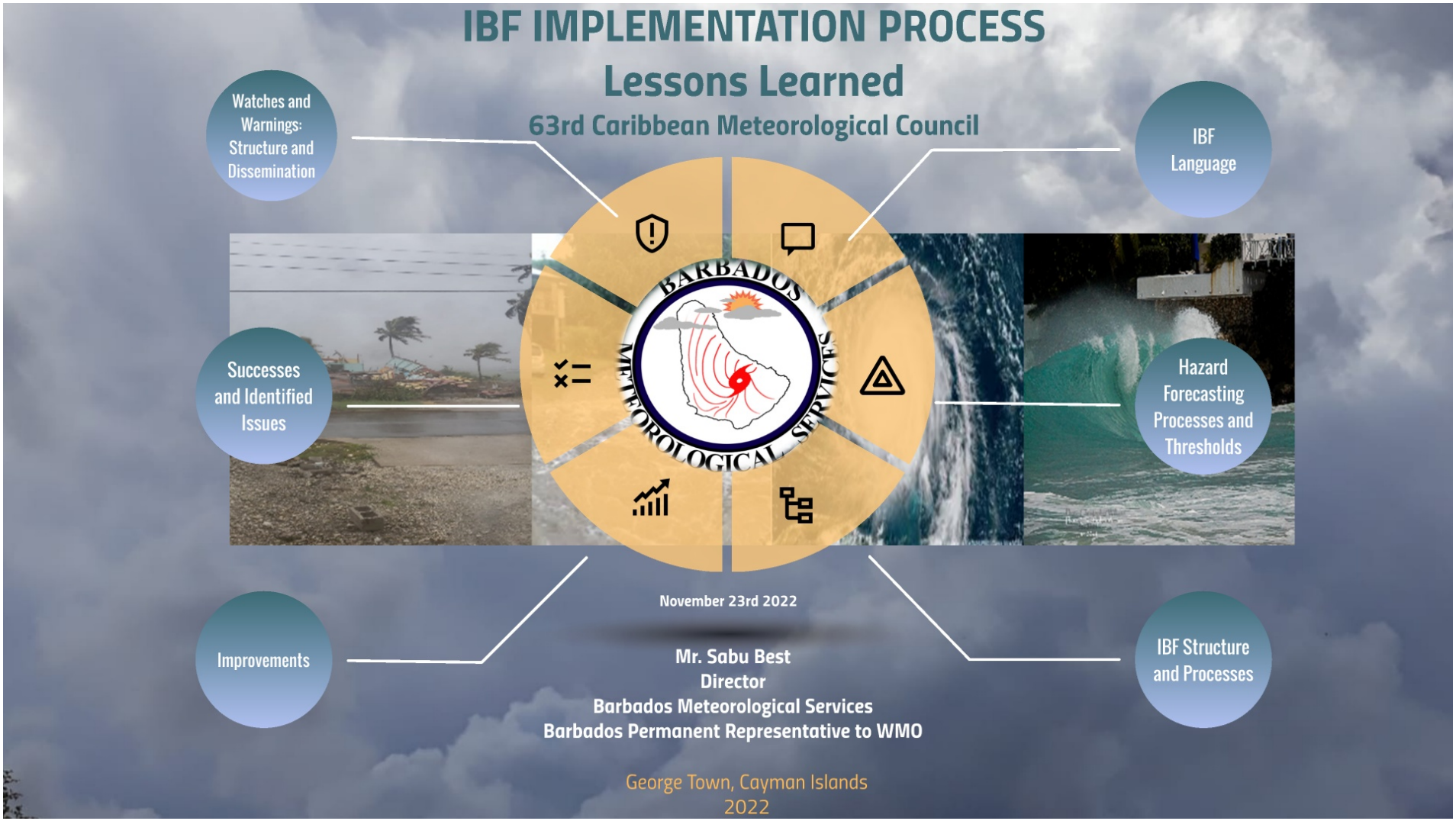
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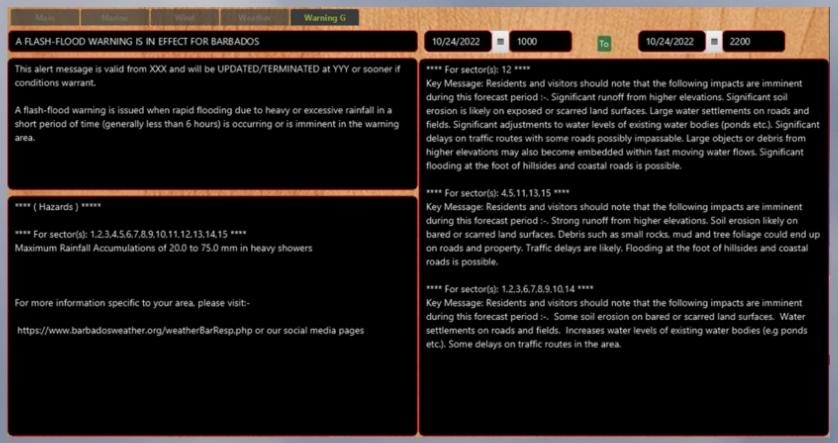
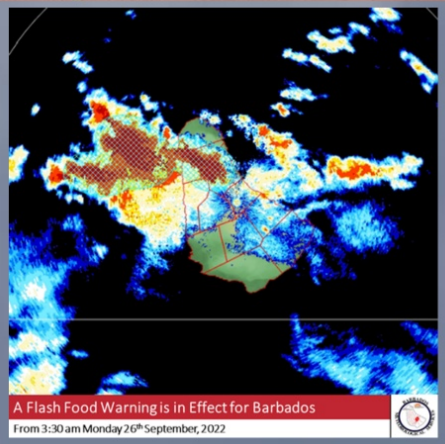
Preset Structure





Barbados Meteorological Services
Civil Aviation Department Building
Charnocks, Christ Church
Telephone #: (246) 535-0021, 535-0022|Fax #: (246) 535-0029
Website: www.barbadosweather.org

A FLASH-FLOOD WATCH REMAINS IN EFFECT FOR BARBADOS
Issued: Wed, 28 Oct 2020 12:04 PM

This alert message is valid from 12 NOON Wednesday 28th October, 2020 and will be UPDATED at 6PM or sooner if conditions warrant.

A Flash-Flood Watch is issued when heavy or excessive rainfall in a short period of time (generally less than 6 hours) could result in flash flooding within the watch area. It does not mean that flooding will occur, but it is possible.

**** Hazard Info ****

A tropical wave interacting with a mid to upper-level trough has already generated up to 20mm across sections of the island. A further increase in rainfall accumulation is expected later today as conditions become more unsettled across the island.

Key Message: Residents and visitors should be prepared for the following possibilities if this alert level elevates to red (Warning):- Significant runoff from higher elevations. Significant soil erosion is likely on exposed or scarred land surfaces. Large water settlements on roads and fields. Significant adjustments to water levels of existing water bodies (ponds etc.). Significant delays on traffic routes with some roads possibly impassable. Large objects or debris from higher elevations may also become embedded within fast-moving water flows. Significant flooding at the foot of hillsides and coastal roads is possible.

For more information specific to your area, please visit:-

https://www.barbadosweather.org/weatherBarResp.php or our social media pages

Prepared by Andrew Daniel
Meteorologist (II) (Ag)
Approved by Tia Browne
Senior Meteorologist (Ag)
Barbados Meteorological Services


63rd Caribbean Meteorological Council
George Town, Cayman Islands
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CAP.CAP

Alerts for watches and warnings automatically sent to mobile phones once published by BMS

CAP.CAP

Active alerts

Common Alerting Protocol based Emergency Warning System

Updated at 08:35 on 14.10.2022

No alerts

kindly use the direct web link provided in this message, or visit our social media pages http://www.barbadosweather.org | Facebook@BarbadosMeteorolog | Instagram@BarbadosMetService | Twitter@BarbadosMet

Contact Tia Browne

Category Met

Urgency Expected

Severity Extreme

Certainty Observed

Sent by Barbados Meteorological Services

CAP.CAP

A FLASH-FLOOD WATCH REMAINS IN EFFECT FOR BARBADOS

Effective 11th October 2022 11:54 am

Expires 11th October 2022 6:00 pm

Description

This alert message is valid from 12:00 Noon Tuesday, 11th October, 2022 and will be updated at 6:00 pm Tuesday, 11th October, 2022 or sooner if conditions warrant.


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George Town, Cayman Islands
Watches and Warnings: Structure and Dissemination Tools
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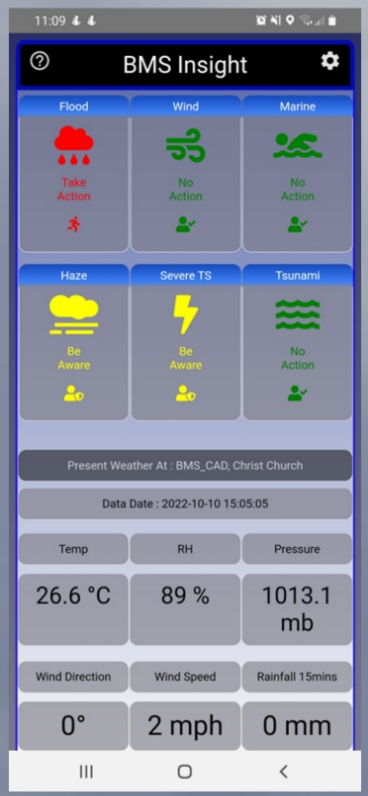
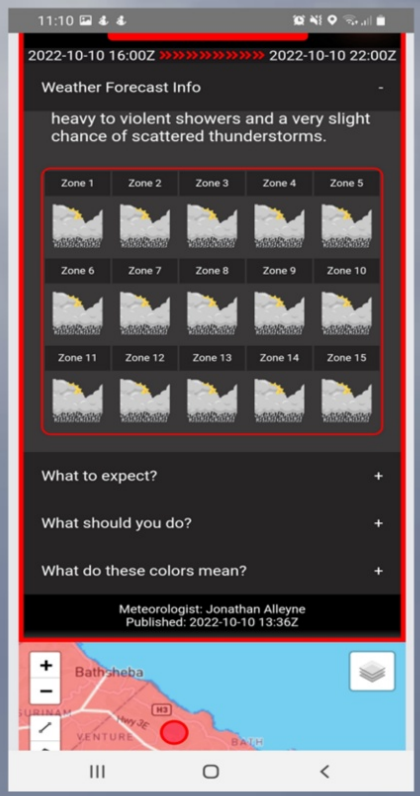
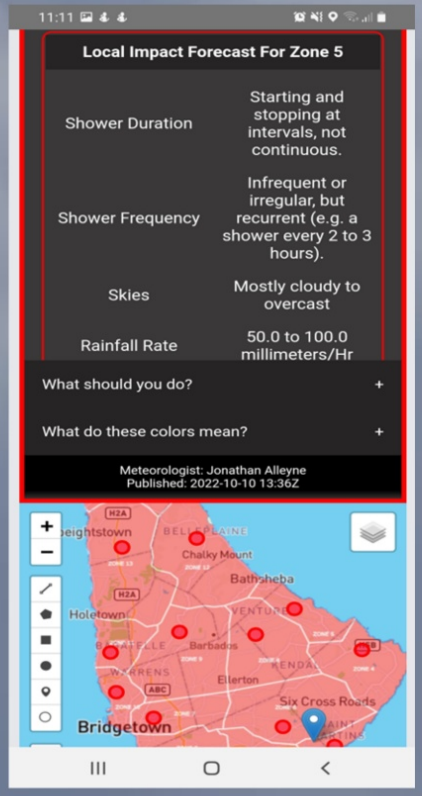
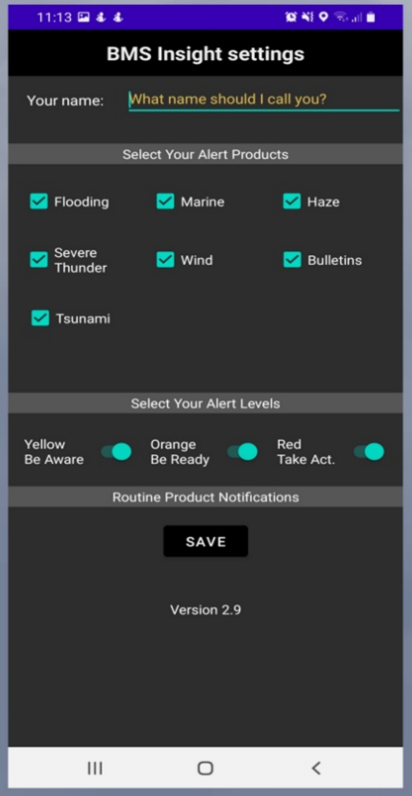
BMS Insight App







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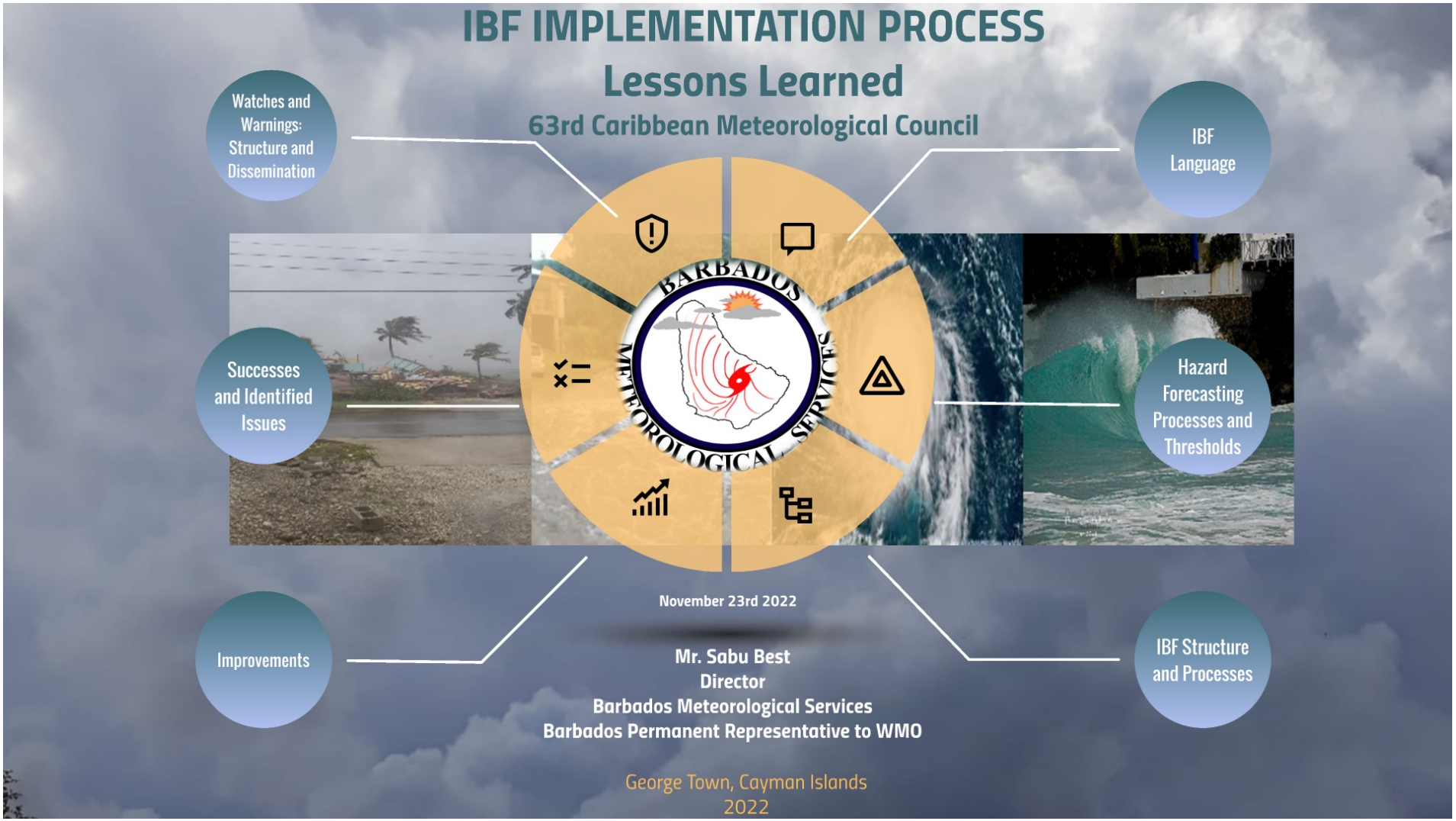
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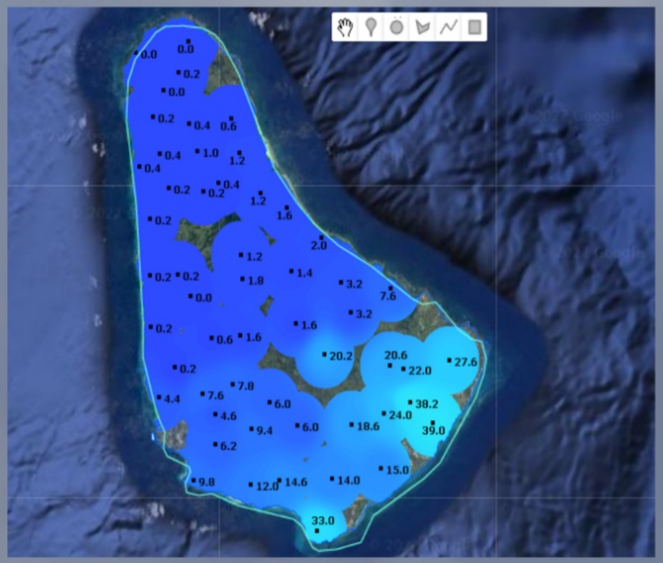
Mesoscale Events

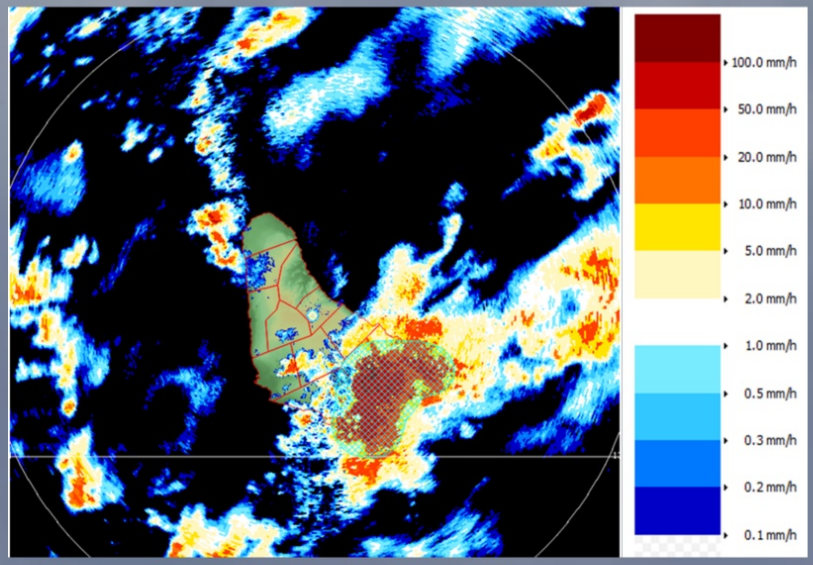
- Isolated events
- High rain rates
- Duration: 30min to 1 hour
- Quick run-off

Rainfall based on rain rates

....But what about duration?



1-hr Rainfall Accumulation



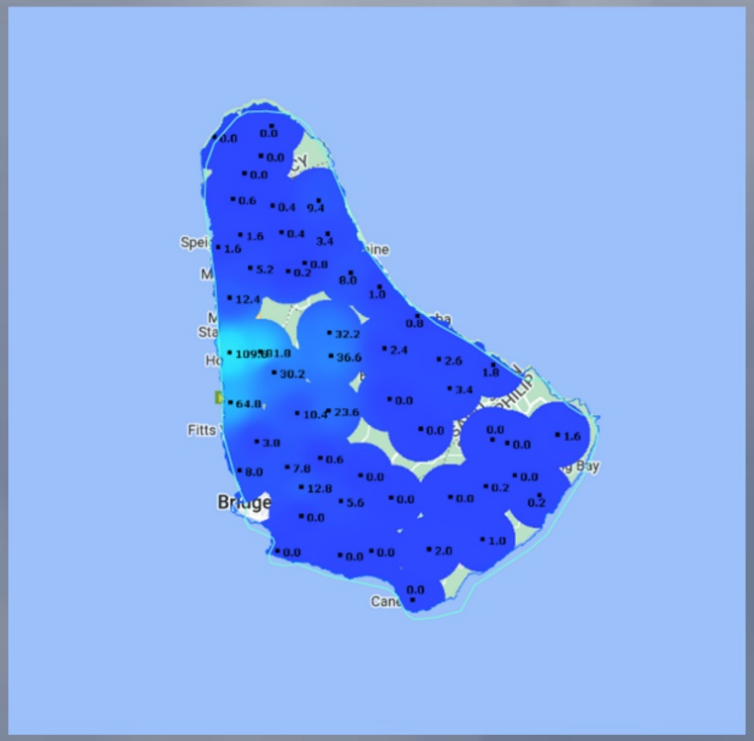
Radar DPSRI

Flash-Flood Watch/Warning?

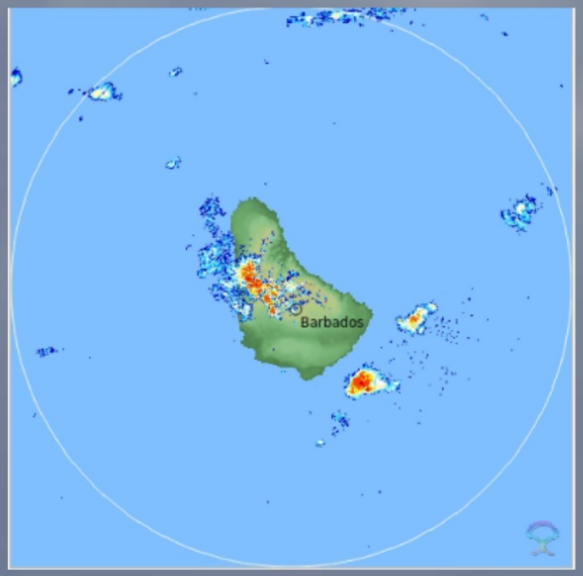
Mesoscale Events

- Isolated events
- High rain rates
- Duration: 30 minutes to 1 hour
- Quick run-off

Rainfall based on rain rates
....But what about duration?



6-hr Rainfall Accumulation



Flash-Flood Watch/Warning?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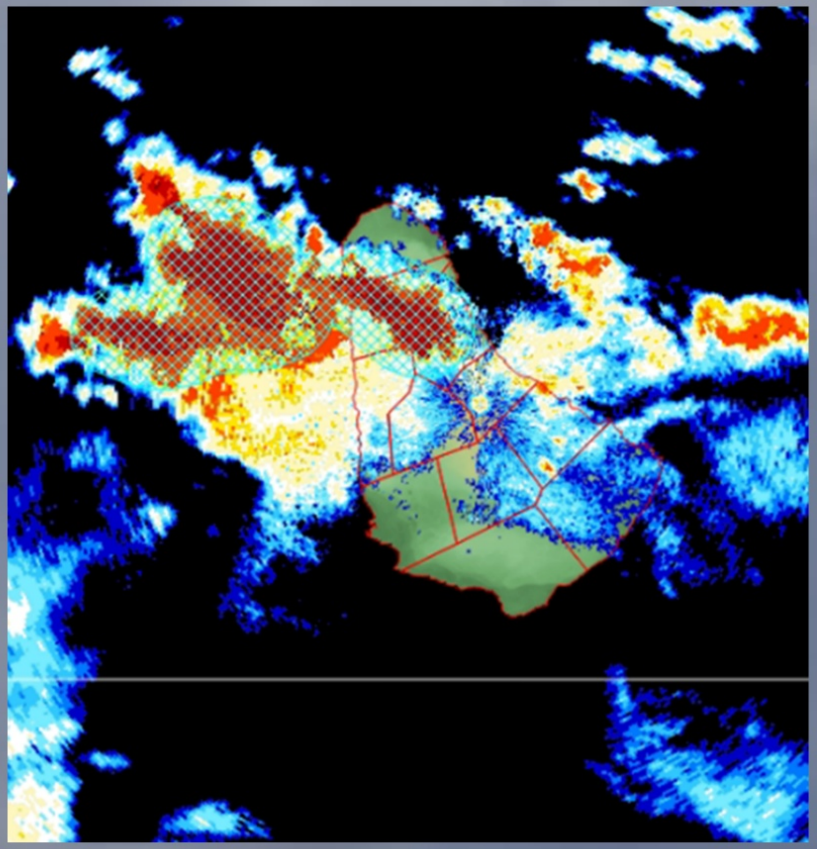
Predictions vs. Impacts



- Rates observed from radar during rainfall events exceed the forecasted thresholds.
- Expected impacts may not always "gel" well with the alert level.

2-ft water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Improvements in IBF Forecasting

- With each event forecasters gain more experience and insight in the use of short-term forecasting products such as those available from radar products and wx stations across the island.
- Forecaster considers other factors that may influence a particular hazard such as the situation on the ground.
- Public reaction and reception help in the feedback mechanism of products produced.
- Added IBF automated decision-making process improves services and product production times.


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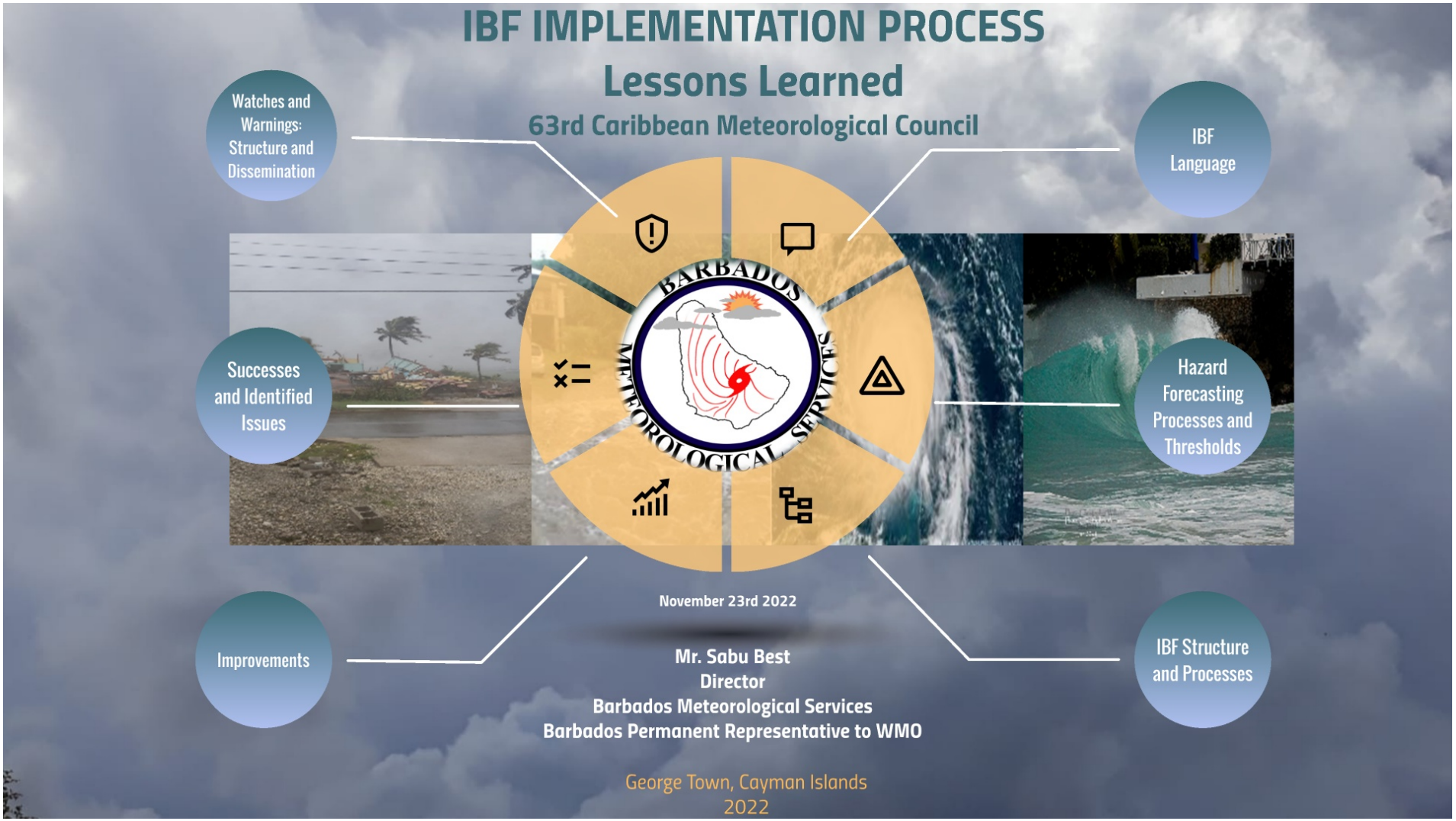
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IBF Forecasting

- Re-evaluation of rain rates for each alert level
- Update impact language (are the identified impacts appropriate for the hazard level?)
- What constitutes the elevation of the alert level? (Consider duration and intensity)
- Providing less subjective forecast among meteorologist (Is this achievable?)
- Consider, the type of event and incorporate conditions on the ground.


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Media Platforms

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George Town, Cayman Islands

BMS Insight

- Ability to view bulletins/watches/warnings
- User defined notifications (warning fatigue?)
- Provision for apple users

Social Media/Partnership

- Reassessment with DEM on what to expect and responses the public should exercise
- Improvements in transmission delay to media outlets
- Continued improvements in social media presence.


63rd Caribbean Meteorological Council
George Town, Cayman Islands
IMPROVEMENTS
IBF
Forecasting
Media
Platforms
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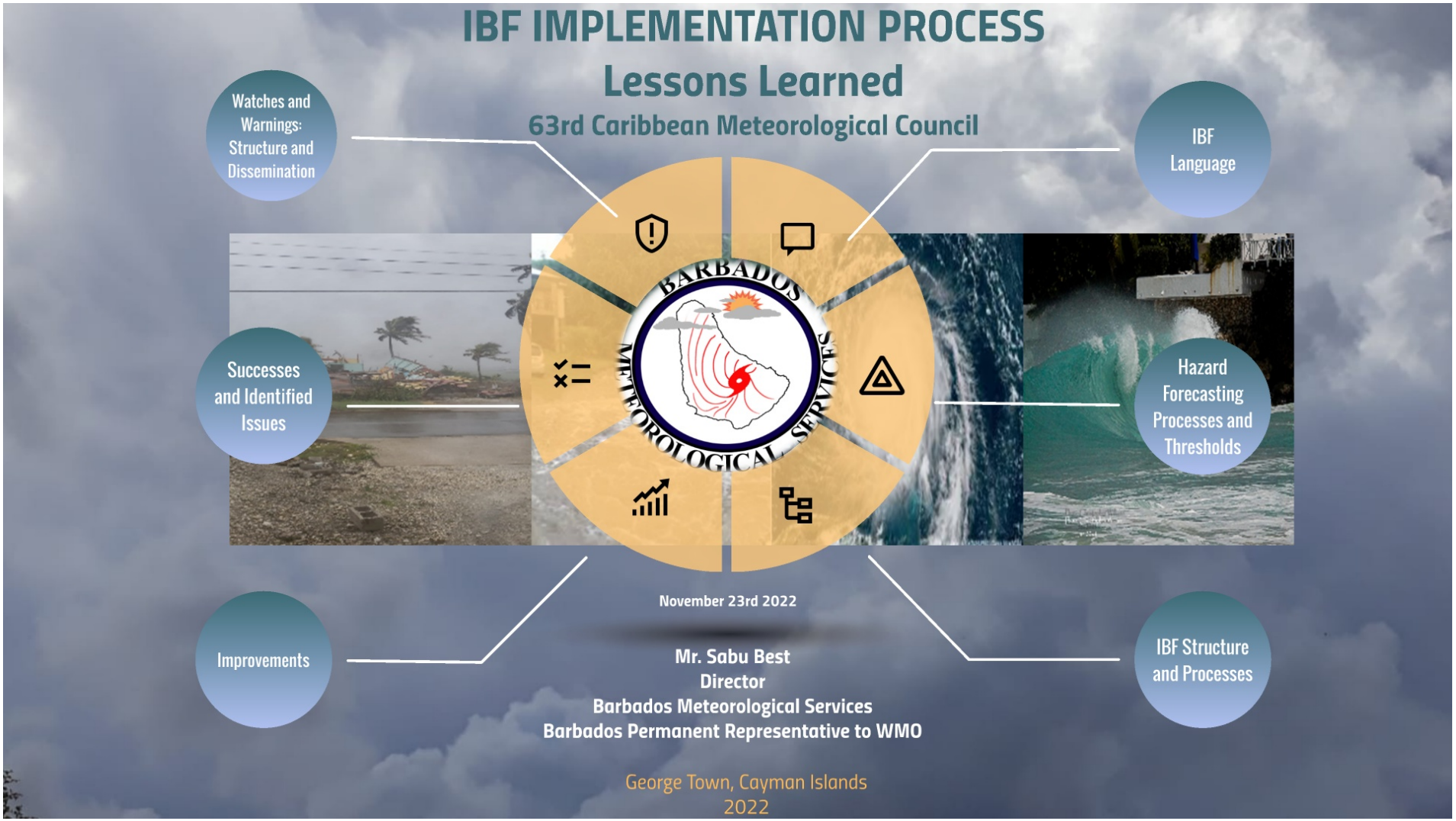
IBF IMPLEMENTATION PROCESS
Lessons Learned
63rd Caribbean Meteorological Council
Watches and Warnings: Structure and Dissemination
IBF Language
Successes and Identified Issues
Hazard Forecasting Processes and Thresholds
Improvements
IBF Structure and Processes
BARBADOS METEOROLOGICAL SERVICES
November 23rd 2022
Mr. Sabu Best
Director
Barbados Meteorological Services
Barbados Permanent Representative to WMO
George Town, Cayman Islands
2022