WEATHER CLIMATE WATER
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Current status of operations of the Caribbean Climate Outlook Forum (CariCOF)

Adrian Trotman, Cedric Van Meerbeeck, Roché Mahon
Caribbean Institute for Meteorology and Hydrology (CIMH)

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World Meteorological Organization
Organisation météorologique mondiale

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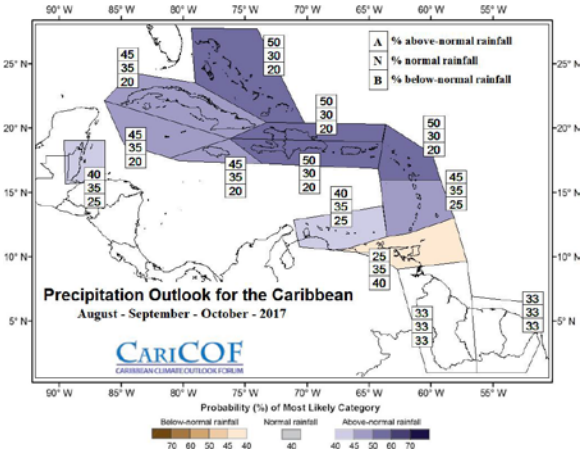
CariCOF background

- *CARIBBEAN Climate Outlook Forum - from the Guianas to the south up the eastern island chain, across the Greater Antilles, and The Bahamas, and including the Central American country of Belize. It includes the English, French, Spanish and Dutch islands*
- *Led by the Caribbean Institute for Meteorology and Hydrology, the Caribbean Regional Climate Centre*
- *CariCOF frequency - held twice per year; at the beginning of the (i) Wet/Hurricane Season and (ii) Dry Season*
- *Climate context – one wet season, one dry season per year (except in the northern portion of the Guianas that experiences two wet and two dry seasons per year associated with the passage of the ITCZ)*
- *Major Climate Drivers – (i) El Niño Southern Oscillation (ENSO) and the gradient in sea surface temperature (SST) between the Pacific and the Atlantic, (ii) North Atlantic Oscillation (NAO) and North Atlantic High Pressure cell, (iii) Madden Julian Oscillation (MJO), (iv) Caribbean Low-Level Jet, (v) Saharan Air layer*
- *Funding Sources – international donor support, including through projects – recently/near future/traditionally NOAA, USAID, ECC Canada, WMO, PPCR*



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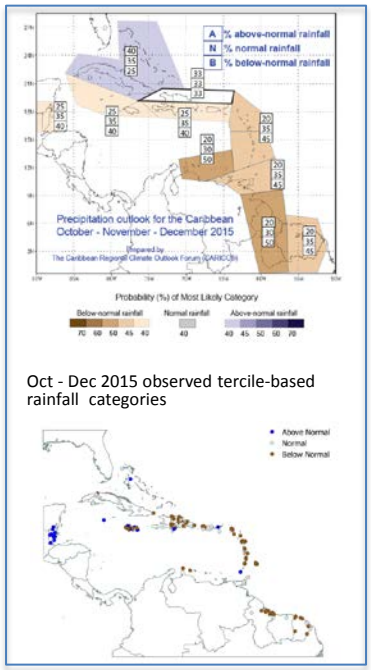
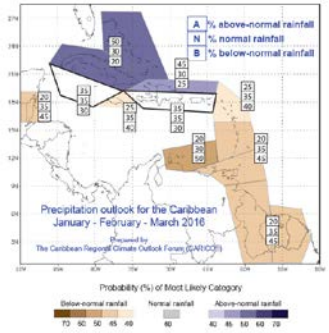
The CariCOF process (1/2)

- *climate outlooks are produced each month by combining global, regional and national forecasts and expert interpretation*
- *forecasts produced using the Caribbean Outlook Generator (CAROGEN), an automation platform. Integrated with CPT to run a set of ensemble experiments*
- *daily and monthly Caribbean precipitation and temperatures data are stored within CAROGEN*
- *GPC-LRF and IRI input data*
- *0-month and 3-month lead, objective consensus forecast maps are produced - tercile three-month rainfall totals and minimum, mean & maximum temperature averages*
- *Final output based on CAROGEN/CPT model outputs, the level of agreement between the different models and expert knowledge of the regional setting*
- *Non tercile products - CariCOF produces a series of thematic or hazard-specific outlook products…*
- *…Drought outlooks (with alerting system), wet days, wet spells, heatwave days (experimental)*

Long-Range Forecasts – Consensus-based

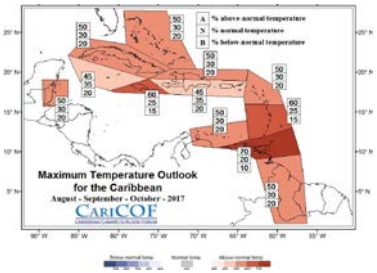
Possible through use of GPC data and supported by GPC products including the WMO Lead Centre for LRF MME

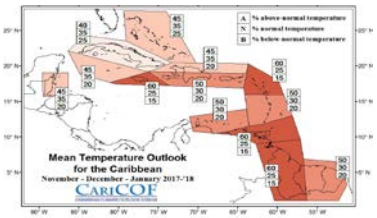




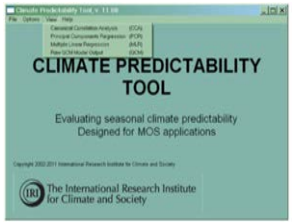
Oct - Dec 2015 observed tercile-based rainfall categories

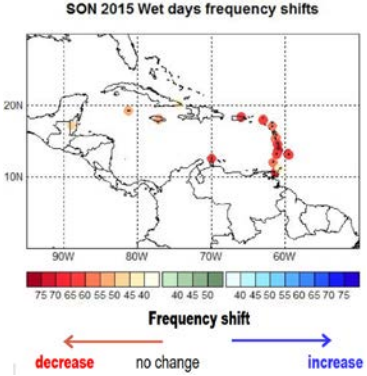
0-/3-ml Tercile-based precip. and temp. outlooks + verification

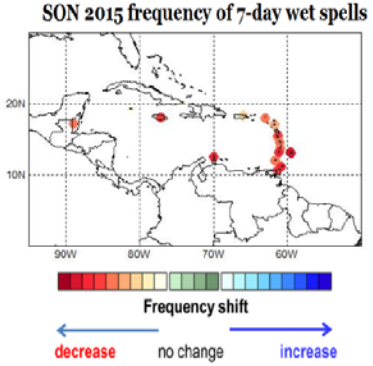




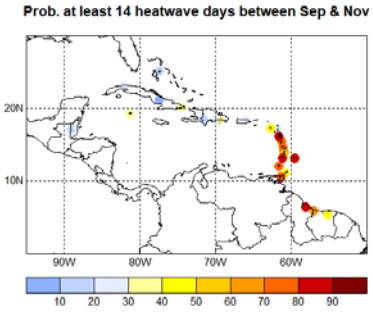
Apr – Jun 2017 observed tercile-based minimum temperature categories

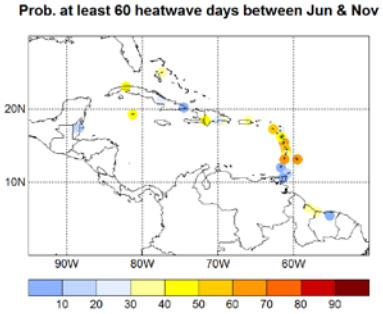


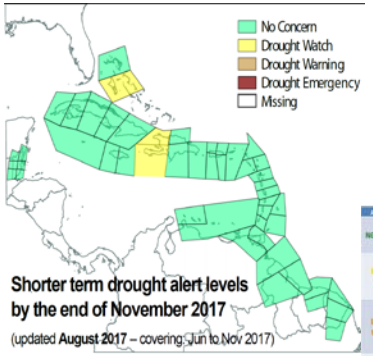


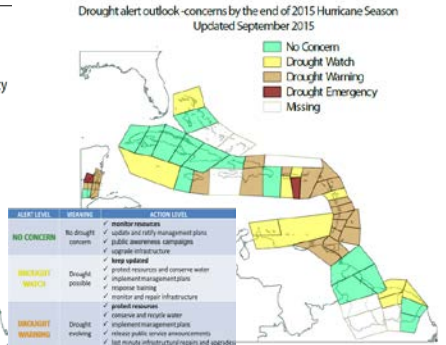


Thematic / hazard-specific outlooks



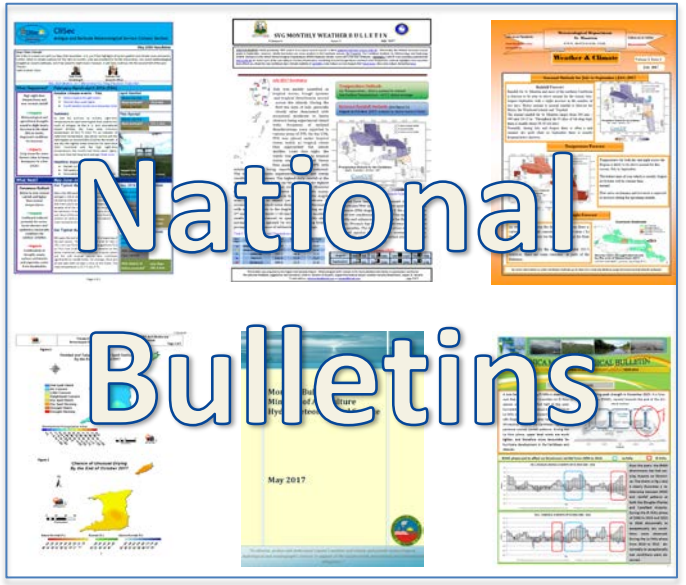






The CariCOF process (2/2)

- *Climatologies and monitoring information from CIMH/RCC, IRI, NOAA/CPC contextualises outlooks.*
- *Caribbean Climate Outlook Newsletter summarises climate conditions, impacts, climatologies and outlooks.*
- *Newsletter + extensive technical outlook presentation + RCC web page provide NMHSs with a wide range of relevant climate information to produce their outlooks.*
- *Thematic and sector-tailored bulletins package relevant information for specific stakeholders concerned with drought, health, tourism, agriculture, coral reef bleaching.*
- *Participating countries disseminate the outlooks through:*
  - *NCOFs (currently Trinidad & Tobago, Belize, Guyana, Suriname);*
  - *Downscaled forecasts (19 countries issue national outlooks, with many going beyond the standard tercile based outlooks);*
  - *national bulletins containing national or regional climate outlooks;*
  - *and/or simply highlighting portions of the CariCOF outlooks relevant to them.*



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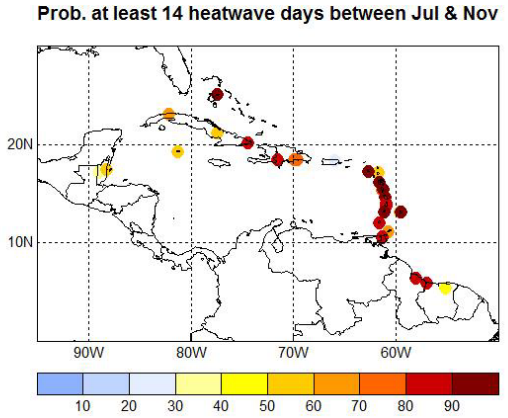
Capacity Development Activities

- *Since 2012, pre-CARICOF training supporting a consistently growing body of Caribbean climate forecasters contributing to the monthly seasonal climate outlooks…*
- *…training – in the art of seasonal forecasting (with support of IRI and NOAA), and preparation of seasonal outlook and presentation*
- *Preceding each CariCOF – wet/hurricane season and dry season*
- *Training typically 2 to 3 days*
- *Focused topics, including at least one new seasonal forecast product (or series of products) – e.g. the heat wave forecast at Wet/hurricane season CariCOF 2017*
- *Also training on new tools, e.g. CAROGEN*
- *…anticipating some focus on enhancing with dynamic model outputs*



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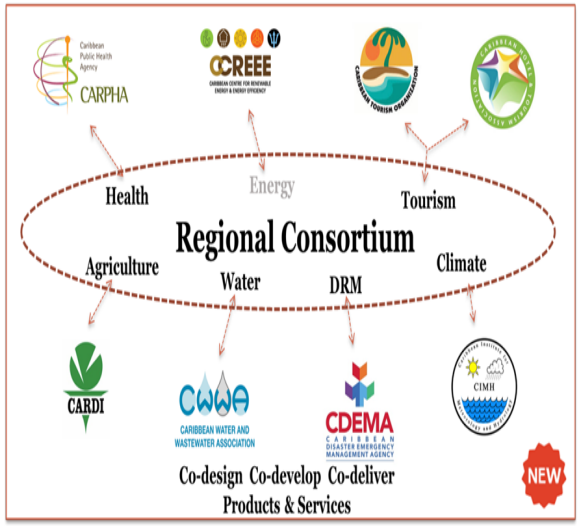
NMHS Capacity Gaps

- *Need trained staff that focus their energies on climatology – pre-CariCOF training provides some of that in short workshops sessions that focus specifically on climate forecasting and outlooks – but in many NMHS, need skills beyond what this training provides…*
- *…this would have to be supported by organisational structure change and financing (to the degree level)*
- *…the legal mandate to move beyond aviation and weather information, to include the authority on climate forecasting in most cases*
- *Enhancing GIS skills would also support product development*
- *More than half of Caribbean NMHS do not manage a Climate Data Management System – being solved with the release of the Caribbean Climate Database Management System*
- *No support from communications specialists in most cases*
- *Though some capacity being built to interact with certain sectors regarding the seasonal climate forecasts and implications – more needed, and including non-traditional sectors*

User Involvement (1/2)

- Current user focus mainly on GFCS related sectors
- Caribbean agencies in all five GFCS sectors, along with tourism, are invited to every CariCOF – focus on recently launched Regional Consortium
- Due to nature of impacts of the two seasons, wet/hurricane season focuses more on DRR; dry season on water and agriculture with the relevant participation of national sector agencies/ministries
- Depending on theme of specific CariCOF, other sector participants from national agencies are invited
- Roving CariCOF allows for more exposure and user engagement in each country - physical development, finance, planning, and financial institutions from the host country
- Since 2014, much greater focus on media houses – supporting message dissemination to public



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User Involvement (2/2)

- CariCOF is a major mechanism for feedback
- Discussions (including sector implications and applications of forecasts) and interactive sessions
- Feedback captured in reporting and further discussed as opportunities arise (including at Consortium meetings)
- Such feedback led to the development of tailored, non-tercile products – drought, wet days, wet spells, heat waves
- Sessions that simulate decision making in response to climate information – e.g. drought tournament, multi-hazard tournament

SWOT analysis

Strengths

- *Building capacity of NMHSs through training, including on a tool that automates and standardizes the forecast process and reduces man-hours demand*
- *Supporting the understanding, interpretation and application of not only CariCOF outlook information, but a range of climate-related information that supports sector decision-making*

Weaknesses

- *Need more engagement of certain groups – private sector (including financial and energy sectors) and highest level of government*
- *The inability to illustrate the economic value of the CariCOF products and services*

Opportunities

- *With much focus on climate adaptation amongst the donor community, opportunity to sustain and expand the role of CariCOF*
- *In alignment with current global interest in sub-seasonal forecasting, CariCOF has the opportunity to satisfy one of the major demands of the user community*
- *With growing interest in valuing weather and climate services at the global scale, there is optimism in providing crucial information on the value of CariCOF*

Threats

- *The greatest threat to CariCOF is the lack of funding – many knock on effects*
- *For some NMHSs, lack of legal mandates and current structures not supporting the provision of climate services, including outlooks*

Way Forward (1/2)

Sustaining CariCOF

- *In the near future some reliance on the international donor community, but…*
- *Greater engagement of the private sector, not only participate and benefit from information provided, but also provide financial support for the forums.*
- *Opportunity for revenue generation from private sector that can be plugged back into the CariCOF and climate services processes.*
- *National support for the staff of NMHSs and sector agencies – part of national annual budgets.*
- *Through BRCCC Programme, a teleconferencing facility can help remote, on-line participation and training sessions.*

User Engagement

- *Engagement of the private sector*
- *Engaging the highest level of decision making in government (some encouraging signs)*
- *Expand the timescales for outlooks based on user feedback – include sub-seasonal*

Way Forward (2/2)

Research

- *Influence of drivers (ENSO, SSTs, NAO) on the wet and dry season, including their start and end,*
- *Impacts forecasting associated with climate-sensitive activities within sectors. This also needs to be supported by research. A major emphasis of CIMH at both the weather and climate scales.*
- *With the support of the EWISACTs Consortium at the regional level, and similar national level structures, information needs would continue to guide future product research and development.*
- *Continued support from social sciences research to make sure of relevance of new products and enhanced products, and how the information or messages are disseminated across each sector.*
- *Greater focus on products using data other than rainfall and temperature. Interest in wildfire occurrence and energy sector products as examples open the opportunity for broader data use.*

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Thank you
Merci

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