Highlights

International Research and Applications Project (IRAP) Contribution to the Caribbean Regional Climate Outlook Forum Assembly

Halcyon Cove by Rex Resorts Hotel
Antigua and Barbuda
December 2, 2014

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Overview

Seventy-two (72) persons representing 25 countries in the Caribbean attended the inaugural dry season CariCOF Assembly in Antigua. Participants represented 8 sectors, including 36 people working in the meteorology and climate services sector and 11 people working in the agriculture sector (see Figure 1). On December 2nd, the International Research and Applications Project (IRAP) contributed to building understanding of seasonal climate variability and risk by hosting 4 sessions, which included:

1. IRAP Project Overview
2. Contextualizing and Sharing Climate Information
3. Opportunities to Overcome Barriers
4. Creating a Climate Dashboard

IRAP's involvement in this forum marked the second consecutive CariCOF in which IRAP participated. A report of the previous workshop, convened in Kingston, Jamaica during May 28-30 can be found at http://irap.iri.columbia.edu/download/irap-workshop-report. Highlights presented here contribute to a growing picture of the key activities, expanding network, and lessons learned from the CariCOFs.

Photographs from the Forum can be viewed on Flickr.com:
https://www.flickr.com/photos/climatesociety/sets/72157649719917681/

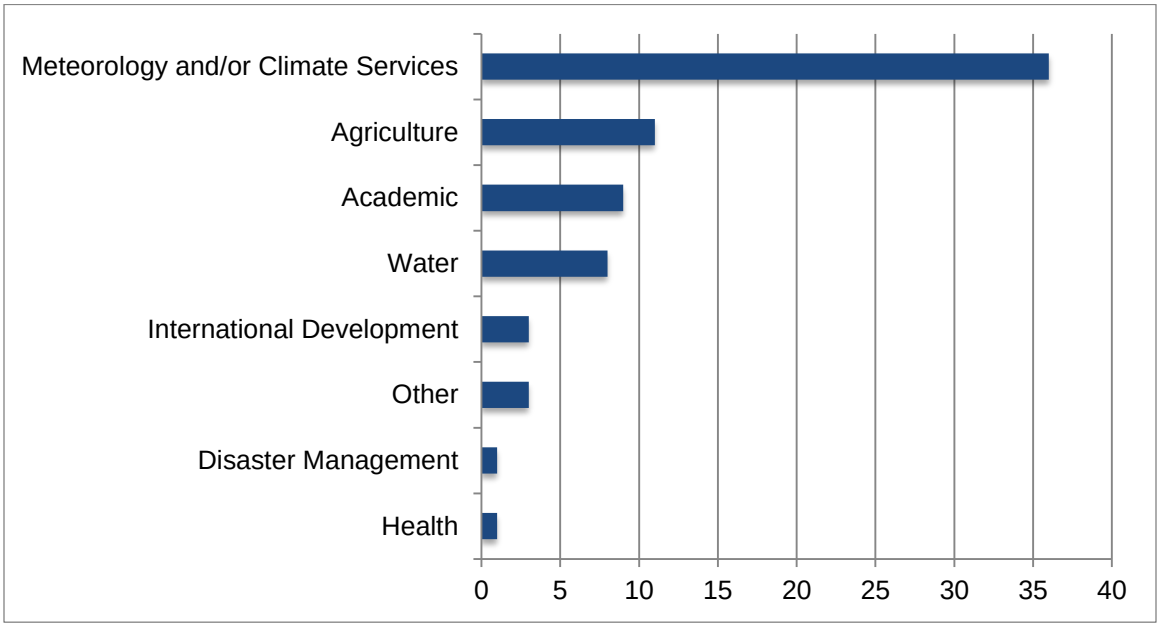

Figure 1. Seventy-two (72) participants at the Antigua and Barbuda dry season CariCOF spanned diverse sectors.

1. IRAP Project Overview

Climate variability and longer-term changes affect many aspects of society. For example, drought can lead to large losses in agricultural productivity and employment, while frequent and intense precipitation can lead to catastrophic flooding. Sometimes adjacent areas experience the same climate event but sustain different impacts. Therefore, a region's climate vulnerability is determined by its ability to absorb or minimize the event and the capacity to recover. The development of climate-related knowledge and information, customized to address specific decision contexts, offers promise to help society cope with and adapt to potential climate impacts.

IRAP integrates physical climate and social science expertise. It is a collaborative effort among scientists at the University of Arizona and the International Research Institute for Climate and Society (IRI) at Columbia University, working with regional partners such as the Caribbean Institute for Meteorology and Hydrology (CIMH). IRAP currently works in the Caribbean and Indo-Gangetic Plain, and will expand to West Africa in 2016.

IRAP integrates climate vulnerabilities, climate services, and evaluation in order to create a more seamless connection between climate information supply and demand. IRAP conducts assessments of vulnerability, which characterize who is sensitive to climatic risks, how they are sensitive, what capacities exist to adapt and cope, and in what ways climate information can help support decisions. Knowledge gained from the assessments helps inform the development of new or the modification of existing information or products (i.e."decision support tools") that are tailored to fit user needs. At times this may direct research activities to understand, quantify, and reduce uncertainties in the climate knowledge system. IRAP also evaluates the newly created as well as existing decision-support tools, which helps refine them and leads to the identification and implementation of best practices. The foundation of this process is cultivating working relationships with local partners who identify knowledge gaps, contextualize local challenges, and are integral in all phases of the project.

2. Contextualizing and Sharing Climate Information

Many people attending the CariCOFs are important in connecting seasonal climate information to users. Although some participants produce the seasonal climate forecasts, nearly everyone who participates in the forums share the information with others. This intermediary role places them between the information producers and end-users of that information. It is a role that can facilitate the use of climate information by helping end-users overcome barriers they experience when attempting to apply the information.

Participants at the Antigua and Barbuda and Kingston CariCOFs highlighted numerous, value-added, "brokering" activities they perform while sharing the seasonal climate information. These brokering activities can help users of climate information better understand it by explaining technical language, providing country specific data absent from the regional forecasts, and including information that explains the forecasts' meaning to different sectors. Discussion and activities at both CariCOFs revealed many different brokering categories (Table 1).

Table 1. Information brokering activities performed by participants at the Antigua and Barbuda (Dec., 2014) and Kingston, Jamaica (May 2014) CariCOFs.

Brokering Activity	Examples from CariCOF Participants
Explain science jargon	• Provide explanations of acronyms and legend • Explain what terms mean, such as "tercile" and normal, above normal and below normal
Interpret forecast	• Provide adequate headlines and take away messages to media • Simplify the forecast and explain trends and extremes • Add a summary of predictions in simpler form
Add local climate information	• Include data specific to the country like rainfall and temperature • Review of past rainfall for different areas in the country • Provide previous forecast outcomes and local field conditions
Explain potential impacts to sectors	• Include likely impacts based on sectors • Provide crop impacts • Suggest implications for mosquito breeding potential
Recommend how to prepare	• Provide advice for farmers to aid in decision making • Propose actions to be taken (co-operative and collaborative) for pre-positioning of resources and mitigation planning
Provide additional and complimentary resources	• Inform how to access the data online • Provide latest hurricane forecast if applicable • Inform of other tools like the drought outlook and seasonal forecast
Open lines of communication	• Inform who to contact for more information

CariCOF participants performed different brokering activities when they shared the information. They also communicate the information in different ways. Participants at the Antigua and Barbuda CariCOF shared the information by email, radio, social media, phone, and other mechanisms. About 71% of the time, participants sent information in a one-way, linear chain—from the sender to the recipient. On the other hand, about 29% of the time participants shared the information in a two-way manner that enabled feedback and response, such as encounters in person or over the phone (Table 2). One-way communication serves to inform and two-way communication facilitates feedback and interaction. Two-way communication normally leads to enhanced understanding because it provides opportunities to ask questions and discuss meaning and interpretation. However, there is no one-size-fits-all communication mode; some end users desire and/or require more interaction than others.

Table 2. Information brokering activities performed by participants at the Antigua and Barbuda (Dec., 2014) and Kingston, Jamaica (May 2014) CariCOFs.

Method of sharing	Number and % of times reported	Number and % of people who reported[1]
One-way communication		
Email[2]	61 (47%)	33 (92%)
Website	14 (12%)	4 (11%)
Newsletter	5 (4%)	2 (6%)
Radio	4 (3%)	3 (8%)
Bulletins	2 (2%)	1 (3%)
Report	2 (2%)	2 (6%)
Fax	1 (1%)	1 (3%)
Pamphlets	1 (1%)	1 (3%)
Social media[2]	1 (1%)	1 (3%)
TV	1 (1%)	1 (3%)
Total	**92 (71%)**	
Two-way communication		
In person	17 (13%)	13 (36%)
Phone	17 (13%)	9 (25%)
Skype/virtual meetings	3 (2%)	2 (6%)
Total	**37 (29%)**	

[1]The total number of respondents was 36; [2]Email and Social Media can also be considered two-way.

3. Opportunities to Overcome Barriers

In Antigua and Barbuda, participants observed a brief presentation of the barriers to using seasonal climate forecasts that were identified at the Kingston CariCOF and that have been stated in the peer-review and grey literatures. Following, participants made note of one barrier they perceived to be the easiest to overcome and one barrier they perceived to be the most challenging to overcome. Participants taped their individual responses onto categorized poster boards and discussed them with the entire group.

The barriers noted by participants and summarized from the literature generally fall into 5 categories: (1) the lack of capacity or resources; (2) the need to demonstrate value and benefit of the forecasts; (3) challenges with interpreting and explaining the forecasts; (4) the lack of trust in forecast; and (5) the use of scientific language. Table 3 shows examples of the barriers stated by participants at the Kingston CariCOFs. Many of these relate to communication and the content of the forecasts.

Table 3. Commonly cited barriers to using seasonal climate forecasts

Barrier	Example of Participant Responses
Lack of capacity or resources	• Some organizations/individuals feel that communicating the forecast is not part of the job • Time limitations due to other job responsibilities • Lack of mechanisms within organizations to distribute/communicate the forecast
Demonstrating value and benefit of forecast	• The public does not understand the impacts and so would not act on the forecast • Need more information specific to each sectors so they can communicate the impacts • What does this mean for us? Unless I can answer this it's pointless
Interpreting and explaining the forecast	• Difficulty communicating uncertainty and probability ,associated with the forecast • Participants of the forecast may not fully understand the forecast. I was confused about the circles and the colors [on the maps]…and would have liked more training so I can communicate it more effectively • Media do not understand the forecast or products and so do not communicate them effectively to the public
Lack of trust in forecast	• The sender needs to trust the information because their name is on the line and must be trusted by people using the information • Both forecast communicators and recipients may not understand how reliable the forecast is
Scientific language	• Language barriers associated with translating the science and working with people unfamiliar with scientific jargon

Participants noted that communication barriers were the easiest to overcome. These included statements about communicating probability, explaining the tercile forecast, and knowing the best type of communication (Figure 2). On the other hand, the barriers associated with decision-making, especially flexibility of government or organizational policy and lack of resources or capacity, were identified as the most challenging barriers to overcome. Participants also commonly cited communicating probability as the most challenging to overcome.

While brokering is not a solution to all of the barriers, it seems well positioned to address some, most notably those related to communication and the content of the forecasts. For example, participants identified barriers relating to interpreting and explaining forecasts. This relates in part to the regional scale of the information provided. Brokering can help downscale regional information to the local contexts by adding, for example, the values corresponding to above, below, or near normal and noting the possible impacts associated with the forecast. Brokering also means helping users understand the probabilistic and tercile format so interpretations are not misconstrued. An aspect of improving understanding also relates to avoiding or clarifying technical scientific language. Furthermore, barriers related to capacity and resources can be addressed if the brokering activities that are performed become easier to accomplish. This enables more efficient brokering without sacrificing quality, freeing time to be allocated to other tasks.

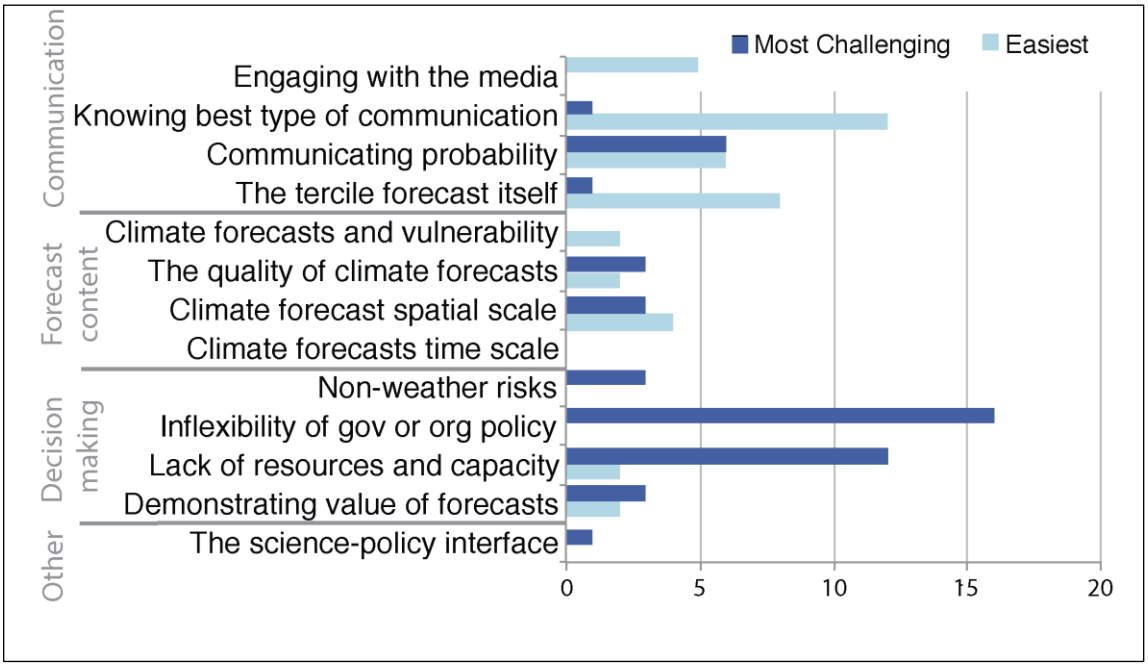

Figure 2. Barriers perceived by participants at the Antigua CariCOF to be the easiest and most challenging to overcome.

4. Creating a Climate Dashboard

End users working in one sector often desire climate information that is different from people working in another sector. While some of that information is available, it may not be fully understood or require slight alterations to become more useable. In other cases, the desired information is unavailable.

In the final session, participants divided into 5 sector groups (see Table 4) and each created climate dashboards. Groups identified to whom they were communicating and selected from 10 options the information they wanted to present.

This exercise was an initial step to understanding: (1) what existing information is useful; (2) the reasons why the information is useful and why some information was not selected; and (3) what other information could be useful.

Table 4. Summary of information featured in Climate Dashboards

Group	Audience	Available Information Selected	Information Desired
Met-1	Policy makers, agriculture, water, energy	• Drought alert map • Precipitation forecast map • Past month precipitation anomalies • Recent precipitation time-series	• Information about uncertainties
Met-2	Diverse users	• Drought alert map • Precipitation forecast map • SPI categories • SPI freq. of occurrence • Past month precipitation anomalies • Past month precipitation totals	• Comparisons to previous years • Correlations to water and climate phenomena such as ENSO
Water	All users (e.g. engineers; farmers; water managers; public)	• Drought Alert Map • Precipitation forecast map • Recent precipitation time-series	• Geo-referenced information • Country specific maps
Agr-1	Farmers and extension services	• Drought alert map • Precipitation forecast map • Recent precipitation time-series	• Rainfall freq. forecasts • Temperature and humidity forecasts
Other	General public	• Drought alert map	• More local information about water resources • How to get more info.

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