

The Caribbean RCOF: Creating outlooks across temporal and spatial scales

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Prepared CIMH, UWI, IRI, NOAA

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Workshop objectives

- Develop climate products accounting for climate variability and extremes
- Highlight using the data that is already available and reliable within available products
 - Learning from examples of others locally, regionally and globally
- Determine the match between what we have and what we need and for whom

(Handout-Pulwarty, R., and N. Hutchinson, 2008. Guidance Manual for Conducting Vulnerability and Capacity Assessments in the Caribbean (CARICOM, World Bank, UNDP) 60 pp. Available from the Caribbean Community Climate Centre 60 pp.

Climate drivers in the Caribbean

- Outlook that will address:
 - the threat to society from climatic events
 - Climate-sensitive development paths to address these threats
- Outlook that considers various timescales....long-term outlook to build on for solutions without creating short term issues
 - Involves looking at how climate extremes feed into the current economic and environmental problems

Developing Early Warning (sub)Systems: Bases for collaboration

Integrating Monitoring and forecasting

National, regional and local levels: Existing, gaps, emerging needs

Risk assessment and scenarios

Allows resource and disaster management authorities to generate their own risk and impact scenarios, trigger and tools development

Communication and Preparedness

Inform actions required to reduce the loss and damage expected from an impending event and for post-event planning

- Planning for the small percentage chance of an event/surprises occurring; e.g. direct hit from storm, etc. Changes in the seasonality of extremes?
- How do we facilitate this process? What resources are available regionally?

- Our understanding of the climate. Benefits and limits if Products?
- Our idea of the future and knowledge of the climate change problem. Informing Adaption? Any examples?
- Separating climate change and variability issues...focus on the latter to facilitate the former
- From here into early warning information systems and adaptations...these need to be further identified in region...data available currently to facilitate these involve NOAA hurricane product, sea bleaching product
- Addressing apparent paradoxes-e.g. trends indicate leveling off of atmospheric temperature, but sea-level continues to rise...how do we account for that?

WMO Commission on Climatology

- WMO developing a climatologist certification program
- Understanding probabilistic products
- Climate adaptation and risk management
- How can WMO help you with strengthening these activities
- Quality management of climatological data
- Using data, defining the normal (10yr verses 30yr, mean and extremes)
- Regional Climate Centers

On the value of seasonal forecasts

- Methodologies used at IRI
 - 2 tiered forecasting system, based on ocean and atmospheric changes (give both ensemble based on current ocean conditions and persisting oceanic conditions)
- This product is objective, the impacts products have a subjective component to them (though small it is difficult to regulate discussion)
- IRI also provide some forecast verification/validation. This is also somewhat of a subjective method, though study show the subjectivity of the experts may be weakening the forecast (in US study)

CPT

- Reducing the subjectivity in ROC through statistical analysis
- Quick overview of the tool
- Building capacity in using this tool
 - Importance of stats background in persons
 - Are persons actually available to do it right now?
- Demonstrated usefulness of tool
- Limitations

- Subjective/descriptive discussion may be necessary in this region... model resolution to consider (lack of land-sea interaction within the models in question)
- Representation of data does/didn't tailor to the end users for impacts, thus a product is available online for manipulation of datasets into formats deemed more viable by the end-user for the enduser

Session 1 summary (1)

What is needed (based on participants input)

- Climate products for the region based on natural climate variability and extremes
- What we have
 - NOAA products: ENSO outlook, hurricane outlook, sea bleaching product
 - IRI products: objectively produced GCM ensemble forecast and products which include some subjectivity
 - IRI tool for massaging outputs into formats useful for final sectoral products
 - Identified sectors who want information about region climate seasonal, annually and longer timescales (agriculture & water/energy)

Session 1 summary (2)

How to get what is needed

- Use freely available tools: their limitations, caveats and strong points
 - Look around ... who else with similar circumstances as ours have done this? Pacific, Indian Ocean
 - Capacity building...through WMO
 - Training programs (short-term and long term-technical qualifications)
 - Using data, quality assuring data, archiving data & statistical analysis methodologies being revised
 - Do we understand our current climate variability...regionally/locally?
 - Regional climate centers

Session 1 summary (3)

When we think about it, what do we really want

- Products that assist risk management (thus need to speak to the users as this is somewhat outside our domain)
- Help on doing this: speak to other agencies within their framing of problems

Session 2

Precipitation indices and forecast interpretations

- Another tool based on using actual/historical data and model data
- Positives: actual data will help in determining the climate variability, indicate teleconnections and can help with determining (weighting) predictors (drivers) at various times
 - Very useful for quantifying uncertainties
 - success in E. Africa: finding the teleconnection—ENSO, being able to build on this for a forecast and then adding this product into food security (famine) outlook
- Negatives:
 - Requires proper consistent data(no sparse data, inconsistent networks)
 - Requires complex mean fields...
 - Using data of various spatial and temporal scales...e.g. Satellite data and obs
- Workaround found (E. Africa study)
 - create dataset based on a composite of spatial means and superimpose temporal anomalies ... building FCLIM climatologies; needs to be tested in region
 - Can be updated by user as data is made available

Caribbean Case studies

- Drought & precipitation outlooks
- Hurricane seasonality and change
- Challenges and sustainability
 - Getting discussion groups going
 - Empowering social groups to use information and promote climate info in adaptation strategies
 - Talking to agencies often...sustaining feedback loops

Session 3

Creating a climate outlook

- Drawing on Central America's 10yr and other experiences
- Application of the climate data to the sectors
- **Step 1: Identify subjective drivers of the regional climate (senior meteorologists useful here)**
 - Network these persons for serious discussion
 - Academics may be needed on this front as well, get UWI & CIMH involved
- **Step 2: Each country downscales/upscopes its own data**
 - Research methodologies for analysis
 - Standardising approaches in the met services
 - Build capacity in the services of persons who will be involved in this activity
 - Using tools e.g. CPT and Costa Rican contingency analysis tool

- Academics get on board with helping solve problems, maybe making it part of their research agenda to better understand the climate drivers and variability and applicable methods
- Downscaling is not a substitute for improving local monitoring and understand local-regional climate relationships
- **Step 3: Determine who uses the product and who wants the information**
 - Poll existing users, determine what were the limitations of the product and what they want to better their management
 - Discuss with the users what can be provided, limitations and caveats
 - Mainstream users into a network group for discussion amongst themselves and with persons creating the product
- **Step 4: Representing and communicating data and information**
 - Graphically and textually
 - Combine work with experts in the various sectors so that advisories can be disseminated for various threshold values of the climatological variables depending on the sector, e.g. fisheries

Lessons learned?

- Dissemination of info: don't hid the limitations of product
 - Beware of verification from global sources
 - Remember the resources with regards to met services: from weather to climate
 - Political strategy to get the governments heavily involved and expecting once they can see the added value of the product to sectors
 - NETWORK and talk always!!! In this case managed separately from any one service

Regional perspectives on climate impacts

- Perceived needs of country, community
- Limitations w.r.t. Climate info
- Opportunities
- Identify capacities
- Summary:
 - Changing trends in temperatures and RR being observed by personnel in the services changes baselines
 - How will climate variability on short timescales affect the sectors ... last drought still in mind
- Agriculture: when can we plant, what can we plant? Extreme events and agriculture
 - Practises adopted in countries mentioned...maybe need to work these into projects to determine sustainability? Documented, distributed, studied on larger scale?
- Insurance for agriculture, for nation

- How do we move from the models (weather and climate models) to the insurance product for agriculture
- Collaboration between agencies locally and regionally needs addressing!
- Local understanding of topography and terrain type drives the impact of the climate on the area
- Health sector and insurgence of vectors (affecting humans and crops)
- Extreme events: storm surges, determining the set back,
- AWARENESS, EDUCATION!!! the service, the public, the sectors, the government

Session 4-Climate change coastal impacts and mitigation measures

- Weather hazards related to climate change within an integrated risk management
- Tools used within sector and information is needed as inputs
 - added value of product being highlighted as in CZMU case (and others) as part of education initiative?
- What products and information can be created via the integrated approach and usefulness Given this information can the quality of data from the RCO be trusted for integration within their tools
 - What are the limitations

Discussion

- Data usage and quality issues
 - CIMH can only archive what they are given
 - Most times information is only sent from the met services → one point data
 - Data rescue missions being funded and seeking funding for retrieving data regionally
 - Noting that statistical methods can be used to create synthetic databases based on the spotty and inconsistent data we have...
 - Requires determining the best technique(s) for this region

Mainstreaming

- What are we doing with the data we have?
- Need to have a cadre of professionals to interpret the data and identify entry points for using information
- Networking issues-benefits of participation
 - Between agencies within country
 - Regionally
 - How to address this?
- Highlighting the importance of climate (data) to successful economies (directly or through other sectors e.g. health, coastal, agriculture)
- Leadership at different levels