



CCRIF *News*

CCRIF, A NOT-FOR-PROFIT COMPANY, IS THE FIRST AND ONLY MULTI-COUNTRY PARAMETRIC RISK POOL IN THE WORLD

CCRIF PREPARING TO LAUNCH EXCESS RAINFALL PRODUCT



The Caribbean Catastrophe Risk Insurance Facility (CCRIF) will make available in its new policy year starting in June the much anticipated excess rainfall product. To discuss the main features of this product, the CCRIF PR Team spoke with Dr. Simon Young, CEO of Caribbean Risk Managers, the Facility Supervisor of CCRIF, asking him questions that we believe our stakeholders would want to know.

CCRIF PR: What was the motivation for CCRIF to pursue the development of an excess rainfall product?

SY: The excess rainfall product was developed after CCRIF participating countries and stakeholders expressed a strong interest in having available coverage for excess rainfall, both within hurricanes and in non-hurricane systems.

CCRIF PR: When will the excess rainfall product be launched?

SY: The excess rainfall product will be launched starting in May of this year, although there will be a gradual rollout as our partners for this project, Swiss Re generate the necessary information on the rainfall index being used for this policy.

Continues on page 2

SPECIAL FEATURE: CCRIF's New Strategic Plan

In February, CCRIF Board of Directors and members of its management team engaged in a two-day strategic planning retreat. This retreat, also called an "advance", laid the foundation for a critical assessment of CCRIF's performance over the last three years, including discussions as to how effective the Facility currently is in meeting stakeholder needs and expectations. It also allowed the Facility to plan for the upcoming 3-year period and to redefine its vision, mission and strategic objectives as well as to set its work programme for the period. See full story on pages 4 and 5.

In this issue

CCRIF Strategic Retreat
Understanding CCRIF Insurance
Policies and Payouts
CCRIF's revised Vision, Mission and
Strategic Objectives
Update on RTFS Usage and
Developments



CCRIF/Swiss Re Excess Rainfall Product

An Interview with Dr. Simon Young

CCRIF PR: Is this excess rainfall product based on the regional rainfall model launched in 2010?

SY: No. During 2008 – 2010, the Caribbean Institute of Meteorology and Hydrology (CIMH) and Kinetic Analysis Corporation (KAC), developed and tested a synthetic numerical rainfall model for the region following an initial feasibility study by CIMH. During an extensive review process, CCRIF decided that the CIMH/KAC model required revision and further testing before it could be used to underpin a parametric insurance programme. The current excess rainfall product is based on a somewhat simpler model which was developed by CCRIF and Swiss Re as a starting point in meeting the needs of CCRIF's client countries. The CCRIF/Swiss Re model is based on available NASA-processed satellite data. This product thus serves as the first iteration of the excess rainfall product, and changes and improvements are expected in the future as the CIMH/KAC work reaches the stage where it can provide complementary input rain data to the satellite dataset.

CCRIF PR: Describe the CCRIF/Swiss Re model

SY: The CCRIF/Swiss Re XSR model uses NASA/JAXA Tropical Rainfall Measurement Mission (TRMM) daily rain data to compile a 5-day running aggregate of rainfall measurements at all of the TRMM grid nodes across a given country. As used in other CCRIF products, the Multi-Peril Risk Estimation System (MPRES) exposure database is utilised to map exposures across a country at 30 arcseconds (~1 km) resolution. Remote sensing data, economic and demographic statistics for 2010 are used to generate the exposure database. The database is designed to provide acceptable estimates for losses to physical assets from hydro-meteorological and geophysical hazards. Since the TRMM nodes are at ~25 km resolution, the 1 km MPRES exposure data is mapped onto the TRMM grid. The value of each exposure node is distributed between the closest four TRMM grid nodes and weighted by distance. This provides a distribution of the total MPRES values between the rainfall measurement points covering each country. For scaling purposes, 1% of the total MPRES exposure value is used as the base XSR exposure.

CCRIF PR: Tell us a bit about how CCRIF will calculate a country's (index) losses

SY: To calculate index losses for both historical and real-time analyses, a 5-day aggregate rainfall is calculated for each TRMM grid node using a moving window, which ensures that peak measurements are captured. A rainfall event occurs when the 5-day aggregate exceeds 50 mm and ends on the day before rainfall next falls below 50 mm. Events are logged for each TRMM measuring point. For each event at each TRMM grid node, the single highest 5-day aggregate rainfall measurement is used to calculate the index loss rate via a vulnerability curve which maps indemnity percentage to rainfall amounts.

The indemnity rate for each event is applied to the exposure value of the TRMM grid node, to give the individual index loss for the event for the grid node. To calculate the national index loss, the individual index losses at each grid node are added together each day. National-level events are defined as continuous periods where there is an ongoing event at one or more TRMM grid nodes. Therefore, once an event occurs at one or more of the TRMM grid nodes, a national loss is assigned to it with the date of the last day of the event as the event identifier. National losses are also aggregated on an annual basis, thus allowing coverage to be offered on a per-event or on an annual aggregate basis at the national level.

CCRIF PR: How does all this fit together to create a country's excess rainfall policy?

SY: For each CCRIF country, the steps described above are taken to calculate index losses. Application of historical rainfall data to the exposure database using the vulnerability function generates a historical risk profile (event-specific and annual aggregate). This risk profile provides the necessary information for CCRIF/Swiss Re to price coverage. Coverage characteristics, within limits, are selected by each country separately (in the same way as existing CCRIF earthquake and hurricane coverage selections are made). Premium cost is risk-based, so depends on the rainfall risk profile of the country and the coverage characteristics selected.

CCRIF PR: What is the relationship between the excess rainfall product and the current hurricane product that CCRIF offers?

SY: The extreme rainfall product is triggered independently of the current hurricane product, and if both policies trigger then both payouts are due. The current hurricane policy is linked to wind and storm surge damage in a defined Tropical Cyclone. While the

Continues on page 6

Understanding CCRIF Insurance Policies and Payouts

CCRIF's recently concluded Stakeholder Analysis identified a key stakeholder need to fully re-articulate the meanings of key elements of its hurricane and earthquake policies. In an attempt to increase understanding among its members, CCRIF will, as a regular feature of its newsletter, identify key areas in which it can elaborate its work and in so doing address members' needs and expectations. In July 2011, CCRIF conducted training on its Real-Time Forecasting System among professionals in the meteorological and disaster management communities from CCRIF member countries. A range of questions on CCRIF insurance policies and payouts were asked by participants. Some of these questions and their responses are presented here to enable our stakeholders to better understand CCRIF policies and payouts.

Countries can purchase coverage up to US\$100 million per peril. Is there a limit on the number of events covered per year?

Countries buy coverage for a given year up to US\$100 million for a hurricane or an earthquake. There is no limit in terms of how many events per year that a policy can cover. The real issue is the specific amount of coverage purchased relative to the impact of an event on a given country in a given year.

What hazards are included in the hurricane payout calculation?

Hazards that are included in computing the loss are wind, wave and storm surge in coastal areas where assets can be at risk from wave and storm surge. The CCRIF payout is based on the loss assessment from the storm as it happens. CCRIF runs the storm track and characteristics in the model after it has impacted the country and computes all loss from wind as well as from wave and storm surge in the coastal areas. That loss estimate then is used in the policy framework to determine if a policy has been triggered or not. Other factors which are included in this policy framework include selection of the attachment and exhaustion points (i.e. the "deductible" and maximum limit) which are also tied to the portion of the risk which countries want to insure. Other considerations include the amount of premium a country has paid. All of these factors are selected and determined by the countries.

What factors led to a payout of ~US\$8.5M to Barbados as compared to US\$3.2M for Saint Lucia after Hurricane Tomas in 2010?

Although there was some concern expressed about the

significantly lower payout received by the Government of Saint Lucia relative to their losses and in comparison to the payout received by the Government of Barbados, it is important to indicate that in the case of Saint Lucia, most of the damage which occurred was a result of the heavy rainfall and secondary induced hazards such as landslides. Neither rainfall nor landslides are included in the current CCRIF Tropical Cyclone policies and are not included in the pricing provided to countries for coverage. In the CCRIF policies, hurricane coverage is related to wind, storm surge and wave action. Also of importance is that payouts countries receive are influenced not only by the hazard levels experienced but also the specific policy arrangements. The coverage selections made by the various countries in terms of their attachment and exhaustion points and coverage limits would have played a significant part in determining the payouts which were received. These parameters are selected by countries and define the policies purchased by the respective governments and essentially are key determinants of when a policy is triggered or not and at what level. Due consideration should also be given to the value of assets insured which will have a major impact on the dollar value of damage experienced.

What is the catastrophic trigger which generates a payout for a hurricane or earthquake?

The trigger level is dependent on the coverage purchased by individual countries. Member governments may purchase coverage which triggers for a 'one-in-15-year' hurricane and a 'one-in-20-year' earthquake, with maximum coverage of US\$100M available for each peril. The cost of coverage is a direct function of the amount of risk being transferred, ensuring no cross-subsidisation of premiums and a level playing field for all participants.

What is the relationship between CCRIF and other insurance providers in the region –in terms of influencing company policies provided at the national level?

There is no relationship between CCRIF and other insurance companies. CCRIF is a regional insurance fund for the governments and it is specifically targeted at providing business interruption coverage for governments. It is a parametric insurance instrument which is not similar to indemnity type products which are usually offered by the traditional insurance companies. It also operates at a very different level from insurance companies because CCRIF, as indicated, is a regional institution and it is specifically targeted at governments. Therefore, it does not make coverage available for private companies, etc.

CCRIF Prepares New Strategic Plan

The Board and members of the Team of the Caribbean Catastrophe Risk Insurance Facility engaged in a two-day strategic planning retreat in February. This retreat, also called an “advance”, laid the foundation for a critical assessment of CCRIF’s performance over the last three years, including discussions as to how effective the facility currently is in meeting stakeholder needs and expectations. It also allowed the Facility to plan for the upcoming three-year period and to redefine its vision, mission and strategic objectives as well as to set its work programme for the period. In 2009, the Board of Directors and management team of developed their first three-year strategic plan. This new strategic plan will cover the period 2012 – 2015. According to CCRIF’s Executive Chairman, Milo Person, “Strategic planning is important to CCRIF as it serves to focus the organisation’s mission and sharpen our operational effectiveness, particularly in delivering our services to the governments of the Caribbean.”

Overview of Performance for the Period 2009-2012 – CCRIF’s 1st Strategic Plan

The CCRIF Board and Team use performance measures at all levels to monitor strategic progress as well as programme and activity success. By so doing CCRIF is able to continuously align its priorities and link its products, programmes, key activities and operations to performance measures, goals and strategic objectives, and customer values. CCRIF performed well vis-à-vis its Strategic Plan 2009-2012, meeting or expecting to meet most of its targets within that 3-year time horizon. Further, a stakeholder analysis of CCRIF revealed a high level of satisfaction with its performance of most of the objectives and indicated an overall satisfaction rating of the Facility of 88%. To better illustrate the performance of CCRIF, the table below presents CCRIF’s Strategic Objectives against the targets set for the period 2010-2011.

Strategic Objective	Metric	Target 2010/11	Actual 2010/11
To offer products & services responsive to members and stakeholders needs	# of new products and enhancements	2	2
	Product penetration rate	85%	85%
	Dissemination of hazard event reports within 24 hours of event	100%	91%
To raise the profile of CCRIF as a Caribbean Community Entity	Awareness raising materials produced	7	>13
	Awareness raising materials disseminated	4500	>7000
	# of new partnership agreements with regional entities	2	1
	# of website visits from region	3000	2152
	# of press listings	100	326
To support Disaster Risk Management (DRM)	# countries using existing disaster risk products (RTFS)	12	14
	# additional risk management products & support	3	3
	# of presentations/exhibits at workshops, conferences related to DRM	6	>30
	# of publications, articles in newsletters and journals related to DRM	4	9
	# of participants at CCRIF professional development session at annual Caribbean CDM Conference	65	49
	# of members	16	16
To expand coverage & membership	Total exposure	US\$618M	US\$620M
	Diversification ratio	21.10%	22.85%
To achieve sustainable financial integrity	Claims paying ability to total exposure	US\$100M	US\$131M
	Financial strength of reinsurers	Composite AA-	AA-

CCRIF's Revised Vision, Mission and Strategic Objectives 2012 – 2015

The CCRIF Vision

A Caribbean region with optimised disaster risk management and climate change adaptation practices supporting long-term sustainable development

The CCRIF Mission

Our Mission is to assist Caribbean governments and their communities in understanding and reducing the socio-economic and environmental impacts of natural catastrophes.

We do this by providing immediate liquidity through a range of affordable insurance products, developing innovative and dynamic tools and services, and operating in a way that is financially sustainable and responsive to the needs of the region.

CCRIF's Strategic Objectives 2012-2015

- **CORE BUSINESS** - *To provide products, services and tools responsive to the needs of the region*
- **TECHNICAL ASSISTANCE** - *To enhance capacity for Disaster Risk Management and Climate Change Adaptation*
- **CORPORATE GOVERNANCE** - *To sustain corporate and financial integrity*
- **COMMUNICATION** - *To deepen understanding and knowledge of catastrophe risk and solutions CCRIF provides*

CCRIF Value Proposition

CCRIF promises to:

1. Fill a gap in available insurance offerings in natural catastrophes
2. Give peace of mind and confidence re financial support
3. Supply tools for enhanced disaster risk management
4. Charge lowest possible premiums consistent with long-term sustainability as a joint reserve mechanism
5. Ensure speedy payout
6. Be transparent and accountable

CCRIF Calendar of Events

Visit our website at www.ccrif.org to view our calendar of events

CCRIF AND THE ORGANISATION OF EASTERN CARIBBEAN STATES TO SIGN MoU



The Caribbean Catastrophe Risk Insurance Facility (CCRIF) and the Organisation of Eastern Caribbean States (OECS) are set to sign a memorandum of understanding in this quarter towards *providing a framework within which collaborative activities are to be undertaken and specific areas elaborated between CCRIF and the OECS Secretariat.*

The specific objective of the MoU is to assist the governments of the Eastern Caribbean states to adopt policies on disaster risk reduction and mitigation that minimise the socio-economic, physical and environmental damage caused by natural disasters. CCRIF looks forward to signing this MoU with the OECS and to strengthening this relationship. Over the last three years, CCRIF has signed MoUs with:

- Caribbean Disaster Emergency Management Agency (CDEMA)
- Caribbean Institute of Meteorology and Hydrology (CIMH)
- UN Economic Commission for Latin America and the Caribbean (UNECLAC)

During 2012, CCRIF also aims to sign MoUs with:

- Caribbean Community Secretariat (CARICOM)
- Caribbean Electrical Utility Services Corporation (CARILEC)
- UWI Seismic Research Centre

Excess Rainfall Product

Continues from page 2

excess rainfall product can be triggered for a Tropical Cyclone, it can also be triggered in non-cyclonic systems if the rainfall trigger thresholds are met.

CCRIF PR: Have these rainfall risk profiles been created for all CCRIF countries? Have they been created for countries that are not members of CCRIF?

SY: Rainfall risk profiles are produced by CCRIF as soon as the background exposure and vulnerability data are generated by Swiss Re. This is being done on an ongoing basis, and all risk profiles should be available within the coming months. Risk profiles are being produced and coverage will be offered to Guyana and Suriname as well as to other Caribbean countries not currently members of CCRIF. Once rainfall risk profiles have been developed, CCRIF will discuss coverage options with each country individually and policies will incept once coverage levels have been agreed.

CCRIF PR: Where can stakeholders obtain additional information on the excess rainfall product?

SY: CCRIF is currently developing a page on its website, to provide information on the excess rainfall product.

About CCRIF

CCRIF is a risk pooling facility, owned, operated and registered in the Caribbean for Caribbean governments. It is designed to limit the financial impact of catastrophic hurricanes and earthquakes to Caribbean governments by quickly providing short-term liquidity when a policy is triggered. It is the world's first and, to date, only regional fund utilising parametric insurance, giving Caribbean governments the unique opportunity to purchase earthquake and hurricane catastrophe coverage with lowest-possible pricing. CCRIF represents a paradigm shift in the way governments treat risk, with Caribbean governments leading the way in pre-disaster planning. CCRIF was developed through funding from the Japanese Government, and was capitalised through contributions to a multi-donor Trust Fund by the Government of Canada, the European Union, the World Bank, the governments of the UK and France, the Caribbean Development Bank and the governments of Ireland and Bermuda, as well as through membership fees paid by participating governments.

CCRIF End of Season Hurricane Report – Assessment of 2011 Tropical Cyclone Events

This article provides an analysis of the behaviour of the Caribbean Catastrophe Risk Insurance Facility's (CCRIF) Second-Generation (2G) Hazard and Loss Estimation Model after the 2011 Atlantic Hurricane Season and is taken from the Report "Verifying CCRIF's Loss Modelling Assessment of 2011 Tropical Cyclone Events" prepared by CaribRM, CCRIF's Facility Supervisor. For a full copy of this report visit the CCRIF website – www.ccrif.org.

The CCRIF MPRES Loss Model is a stand-alone tool designed by Kinetic Analysis Corporation to enable the Facility to:

- estimate loss probabilities for individual territories and a portfolio of territories with specific contract terms;
- price contracts for specific territories; and
- estimate site-specific hazard levels and losses for specific events - either historical or active events - during the contract period.

Using the hazard modelling results, the loss module calculates event losses by applying the location and asset class-specific damage assessments to the asset valuations for each individual element in the exposure database. The model calculates losses for each individual asset in the exposure database using damage functions specific to the asset class and the specific hazard levels at the asset site. Territory level losses are the aggregate of losses to all individual exposure elements in the territory. Both hazard and vulnerability modules operate at a base resolution of 30 arc-seconds, approximately 1 km.

A major benefit of the new model is that it results in a reduction in the basis risk inherent in the loss indexing approach used in the first-generation EQECAT model. The purpose of the report is therefore to investigate whether the model accomplished this goal by explicitly addressing the following questions:

- How closely are the CCRIF model wind footprints matched to the NHC's H*WIND and other modelled footprints?
- How does ground meteorological data fit with the CCRIF footprint for wind?
- Do the final losses generated by the model correspond with government and independent estimates?
- How does the breakdown of impact costs affect what can be considered government losses?

The report verified the performance of the model on major Tropical Cyclone events affecting the Caribbean region during the 2011 season. Since there were no tropical cyclone payouts in the 2011-12 policy year, the report investigates Hurricane

Irene, a major event that had the potential to produce a payout if conditions were different. Hurricane Irene affected several islands in the CCRIF portfolio, so the report investigates how final losses generated by the model corresponded with government and independent estimates.

In this article, we will focus on Hurricane Irene's Impact on the Bahamas and the performance of the model. Irene's impact on the Bahamas was concentrated largely on the less populated eastern parts of the island chain, in particular Acklins/Crooked Island, Rum Cay/San Salvador, Cat Island, Eleuthera and Abacos. Irene was a Category 3 storm at the time of passage with peak winds of 115 mph. Subsequent to the passage of the storm, Prime Minister Hubert Ingraham advised that the damage was not as severe as was initially expected or, indeed, reported. The Bahamas Ministry of Tourism confirmed that the major tourism areas of Nassau/Paradise Island and Grand Bahama were quick to return to normal operations after the event.

CCRIF's MPRES model produced government losses in 6 member countries but all were below the loss level necessary to trigger a payout under the parametric programme. The Bahamas sustained the largest modelled loss, both in actual dollars and relative to GDP when compared to the other affected countries. However, the absence of major damage to the areas with highest exposures (Nassau and Freeport) and the lack of impacts on tourism infrastructure in general meant that the loss was well below the trigger threshold.

In the Bahamas, KAC estimated an insured loss of just under \$55 million as a result of Hurricane Irene. The Bahamian insurance industry issued its own estimate of losses, based on actual claims, and projected an overall market loss, for local property and casualty companies domiciled in the Bahamas, to be between US\$35 and 40 million. Taking account of losses to insurance programmes underwritten by non-Bahamian insurers and reinsurers, the final insured loss amount is likely to be closer to \$50 million, and thus very close to KAC's model estimate. This test case provides confidence to CCRIF that its model reasonably represents losses incurred by client governments.

The acceptability of parametric insurance is reliant to a significant extent on the ability of the parametric mechanism of loss estimation to reasonably replicate actual losses (so having minimal 'basis risk', the difference between the parametric-based loss estimate and the actual loss incurred.)

CARIBBEAN CATASTROPHE RISK INSURANCE FACILITY



Report on the Use of the CCRIF Real-Time Forecasting System in 2011

CCRIF provided one hundred and seventy nine users with access to its Real-Time Forecasting System (RTFS) during the 2011 Hurricane Season. This represented an 80% increase in users over the 2010 Hurricane Season. Registered users included personnel from disaster management departments and meteorological offices, ministries of planning, tourism, agriculture and finance as well as a number of international development agencies working in countries across the region in disaster risk management.

In 2010, two new features were added to the RTFS. These were:

- Location-specific hazard values for Haiti: 6-hourly estimates for the wind speed and storm surge values (for offshore points) for 15 locations
- Past Storm Archives - which enabled users to view storms from previous years, for example Hurricane Tomas which affected Barbados, Saint Lucia and St. Vincent & the Grenadines in 2010

The webpage was accessed 571 times from 19 countries. This reflects a 72% increase in usage over the 2010 season. The 2011 Atlantic Hurricane Season recorded a total of 20 tropical cyclones, 7 of which intensified to hurricane strength, with 3 becoming major hurricanes. It was observed that the RTFS webpage was not accessed for only two of these events: Tropical Storms Franklin (August 12–13) and Sean (November 8-11). The RTFS is a storm impact forecast tool which provides users (CCRIF member countries and various international development partners) with real-time hurricane hazard and impact information.

The RTFS is made available at the beginning of the Atlantic Hurricane Season each year which starts on June 1 or when a storm becomes active within the designated CCRIF monitoring region. CCRIF will continue to provide this tool during the 2012 Hurricane Season.

Update on the CCRIF UWI Scholarship Programme

Between academic years 2010/11 and 2011/12 CCRIF has provided 9 scholarships to students at the Mona (Jamaica) and St. Augustine (Trinidad & Tobago) campuses of the University of the West Indies to pursue undergraduate and post graduate studies in Civil and Environmental Engineering, Geography and Geology and Disaster Management. The total value of awards disbursed to date is US\$89,250. CCRIF will continue to provide scholarships to UWI during the upcoming 2012/13 academic year.



Sixteen governments are currently members of CCRIF:

Anguilla, Antigua & Barbuda, Bahamas, Barbados, Belize, Bermuda, Cayman Islands, Dominica, Grenada, Haiti, Jamaica, St. Kitts & Nevis, St. Lucia, St. Vincent & the Grenadines, Trinidad & Tobago and Turks & Caicos Islands

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