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Climate Risk Assessments

Intelligence & Analysis Division
Technical White Paper

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This white paper is designed to provide analysis of relevant, publicly available information on threat and hazard events/trends and their potential impacts to the interests of the United States, both at home and abroad. This product is not intended to be an all-encompassing assessment of the subject.

Climate Analytics

RMC's Climate Analytics team was formed in 2022. The team was created to meet the need for forward-focused climate risk analysis. RMC's expertise in holistic risk assessments put it in the perfect position to step up to meet client needs. From climate resiliency requirements outlined in the National Defense Authorization Act 2022, to critical infrastructure hardening, to promoting sustainability, a wide range of customer needs can be met by RMC's Climate Analytics Team.

The basic need for Climate Analytics lies in within the understanding that the weather of the last 50 years will not be the same for the next 50 years. Therefore, the frequency and severity of a variety of hazards (detailed below), must be assessed with greater depth. With this information, customers can increase the resiliency of their assets and operations, as well as promote sustainable planning for the future.

RMC conducts this assessment with a document called a Climate Risk Assessment (CRA). The CRA is a multi-stage document from which relevant research, customer concerns, on-site observations, and expert analyses are organized and presented.

Risks of Climate Change

As the global climate undergoes rapid changes, an understanding of these trends is necessary to prepare for the future. Recent changes in climate are already outside the normal, natural variations in climate the globe experiences. Many of us have witnessed the effects of a changing climate in our own lives. Failure to plan for the future can have severe consequences to an organization.

Fiscal consequences will be seen when physical assets cannot withstand changing weather patterns and must be repaired, reinforced, or replaced prematurely. Additional fiscal considerations may be found in federal funding incentives to utilize climate-resilient planning, net-zero technology use, and green-initiative integration. Further environmental consequences may occur, such as improperly placed buildings that accelerate the impacts of a changing climate. Finally, failure to consider climate change can have severe impacts on the health of an organization's employees and their families. For example, contaminated water systems from sea water intrusion can lead to illnesses. Until the problem is considered in planning measures, additional fiscal burdens will occur as both the organization and individuals are unable to utilize potable water systems. A basic consideration of changing climate patterns can lead to notable benefits for an organization's future resiliency.

It is important to note that these risks, and the benefits of mitigating them, are not exclusively long-term. For example, events such as increased severity of tropical cyclones are already impacting coastal regions. By taking rapid steps to address the risk presented by this change, an immediate benefit can be seen in increasing the resiliency of customers during the annual tropical cyclone season.

Climate Risk Assessment (CRA)

The procedure for creating a CRA follows RMC's proven risk assessment process. First and foremost, the customer must outline their needs. What questions and concerns would they like addressed? How do they intend to utilize this information? For example, perhaps the customer needs a CRA to ensure the resiliency of their critical energy systems. By beginning with this dialogue, RMC can ensure the end product will not simply check a box, but provide truly informative, actionable results.

The CRA begins with the creation of a document called a Climate Profile. This serves as a research document that supports the entire risk assessment process. The Climate Profile is created by RMC's Climate Analytics team. Applying a unique lens, this document describes the environment a customer will be operating in 10-50 years in the future. This report is written for each specific customer to outline their unique environment, climate, and projected changes. Climate profiles are an unclassified document. This classification decision ensures accessibility to the information for any RMC project needs.

Climate Profiles are comprehensive, academic documents. Within the document is an examination of two of the factors of risk: frequency of occurrence and severity of impact. Analysts note both the current environmental conditions and the projected changes. There is a comprehensive list of specific hazards studied within this document, detailed below.

Following creation of a customer-specific Climate Profile, subject matter experts utilize on-site observations, interviews, and their own professional knowledge to create a risk assessment tailored to the customer's needs.

A CRA also includes work from RMC's Geographic Information Systems (GIS) team. Their work uniquely illustrates many of the observed climate impacts on a building-by-building level over multiple time frames. Additionally, use of RMC's GIS capabilities can often better explain the academic data used in climate projections.

Hazard Categories

The Climate Analytics team examines multiple hazard categories when creating the Climate Profile and Climate Risk Assessment, including meteorological events, climate trends, geological impacts, extreme weather, and biological concerns. The team then breaks down their research into the following 19 categories. These hazards were selected as the most likely areas in which a customer may experience changes in their risk over time due to climate change.

Coastal Storms	Flooding	Insect Outbreaks
Desertification	Landslides	Water Contamination
Drought	Sinkholes/ Subsidence	Air Pollution
Dust-Storms	Thawing Permafrost	Soil Toxicity
Erosion	Tornados	Tick-Borne Diseases
Extreme Temperatures	Tsunamis	Loss of Habitat
	Wildfires	

Not every customer will see impacts in each of these categories. For example, thawing permafrost and coastal storms have a limited area of application. However, by creating a core list of assessed local hazards, customers can be confident of the areas examined and researched throughout the process.

Emission Scenarios

There are multiple factors that must be considered in assessing climate risk. One of the most important to consider is known as an emission scenario. Emission scenarios refer to the projected rate of CO_2 emission releases in the future. A low-emissions scenario generally refers to a situation in which current emission rates are greatly curbed. A high-emissions scenario represents little to no change, with global emission rates that continue to rise.

Naturally it is impossible to predict the political, economic, and scientific developments that will impact which emissions scenario the globe will experience. As such, the Climate Profile and Climate Risk Assessment include analyses under multiple emission scenarios whenever possible. This provides the customer with the most well-rounded understanding of their risk in the future. In the situations where data is too limited to provide projection under multiple emission scenarios, a relatively reliable assessment of customer risk can still be carried out. This is because much of the time emission scenarios impact the severity of the projected changes, but not the basic trend itself.

For example, as global temperatures increase, so too do instances of extreme heat. This general increase is a reliable data point under which risk assessments can be carried out. However, the emission scenario used will dictate the severity of this increase – e.g., how many degrees the average global temperature will increase. Therefore, our product often provides assessments utilizing low, moderate, and high emission scenarios. Again, this benefits our customers by providing them with the tools to prepare in the way that best fits their needs and goals.

Client Goals

Once the Climate Profile has been created, the research must then be paired with onsite observations, customer interviews, and appropriate in-house subject matter experts to create a Climate Risk Assessment. Risk can only be properly assessed when considering the following factors: frequency of occurrence, severity of impact, and criticality of the assets. When those data points are paired for certain government clients, the information will often need to be classified to protect the safety and security of our customers.

As discussed earlier, the impacts of climate change are evident across the globe. By assessing and mitigating climate-related risks and hazards, customers can reduce fiscal and environmental impacts to their organization and minimize employee health impacts. CRAs provide each customer with a detailed overview of the risk to their assets and organization. CRAs can also be customized to meet specific customer needs, such as promoting water system resiliency, providing comprehensive data for community partnerships, and strengthening funding requests.

Learn more about the work Climate Analytics can do for you – email us at sales@rmcglobal.com