

# The value of GBON: Exploring the Insurance Sector

**SYSTEMATIC OBSERVATIONS FINANCING FACILITY**

Weather and climate information for the global public good



**SOFF**

Systematic Observations  
Financing Facility

## INTRODUCING THE SYSTEMATIC OBSERVATIONS FINANCING FACILITY

The Systematic Observations Financing Facility (SOFF) will support countries to generate and exchange basic observational data critical for improved weather forecasts and climate services. It will provide technical and financial assistance in new ways – applying internationally agreed metrics – the requirements of the Global Basic Observing Network (GBON) – to guide investments, using data exchange as a measure of success, and creating local benefits while delivering on a global public good. The SOFF will contribute to strengthen climate adaptation and resilience across the globe, benefitting in particular the most vulnerable.

The creation of the SOFF is spearheaded by the World Meteorological Organization in collaboration with a wide range of international organizations, including the members of the Alliance for Hydromet Development. The Alliance unites efforts of major development and climate finance partners to close the capacity gap on high-quality weather forecasts, early warning systems and climate information.

### KEY TAKEAWAYS

1. In situ observations are a critical part of the weather machine and are foundational to understand and manage climate risks.
2. The Global Basic Observing Network (GBON) will significantly increase the availability of surface-based observations, improving weather forecast and climate services. These improvements will in turn provide opportunities to invest in climate resilience and enhance risk management to increase the resilience of investments across the world.
3. The insurance sector is a key player contributing to climate resilience. The sector has great capacity and know-how in risk and impact analysis.
4. Having access to robust climate and weather data is vital to inform current and future decision making in the insurance sector. As climate-related weather risks become increasingly complex and unpredictable, insurance is gaining prominence as an adaptation risk management measure.
5. The implementation of GBON will not only improve timely and spatial availability of observational data, it will also increase the functionality and application of satellite data which require in situ validation.
6. The insurance sector recognizes the value of GBON for its products and operations, deriving from the improvements to hazard weather data and, over time once implemented, a more complete historical record. Increases in forecasting capability will enable pre-emptive risk management measures to be implemented reducing loss and damage.

7. The creation of a Task Force is proposed to further develop options for sustainable financial contributions to GBON, through the Systematic Observations Financing Facility (SOFF). The Task Force would be mandated to operationalize the two proposed avenues to mobilise private sector resources (i.e. developing innovative financial mechanisms and developing a resilience case to mobilize contributions from the private sector) with the target of achieving this by UNFCCC COP26.

## INTRODUCTION

**In situ observations are a critical part of the weather machine, which is foundational to understand and manage climate risks.** Almost all weather and climate services depend on global Numerical Weather Prediction (NWP) systems, which require a comprehensive data feed of weather observations, shared in real time by all nations.

**Whilst some parts of the globe provide a reliable feed of observational data, in many areas the availability of such data is limited and, in several instances, getting worse.** For example, Africa shows a dramatic decrease of almost 50% from 2015 to 2020 in the number of radiosonde flights, one of the most important types of surface-based observations.<sup>1</sup>

**The inhomogeneity across the globe in both network density and volume of observations internationally exchanged is striking.** This lack of observational data significantly impacts the quality of information used by stakeholders across the globe to build resilience, manage weather and climate risks and mitigate the impacts of extreme weather events.

**The visual below shows the current data availability** (green dots are meeting the current data requirements, yellow dots are stations with data sharing quality issues, orange dots are points where observations received satisfy only between 30-80% of the requirements, red dots are points where observations received satisfy less than 30% of the requirements, and black dots are points that are not sharing observations internationally). The large data voids (areas without any dots on the map) reflect significant lost opportunities to provide better weather and climate information products for all nations.

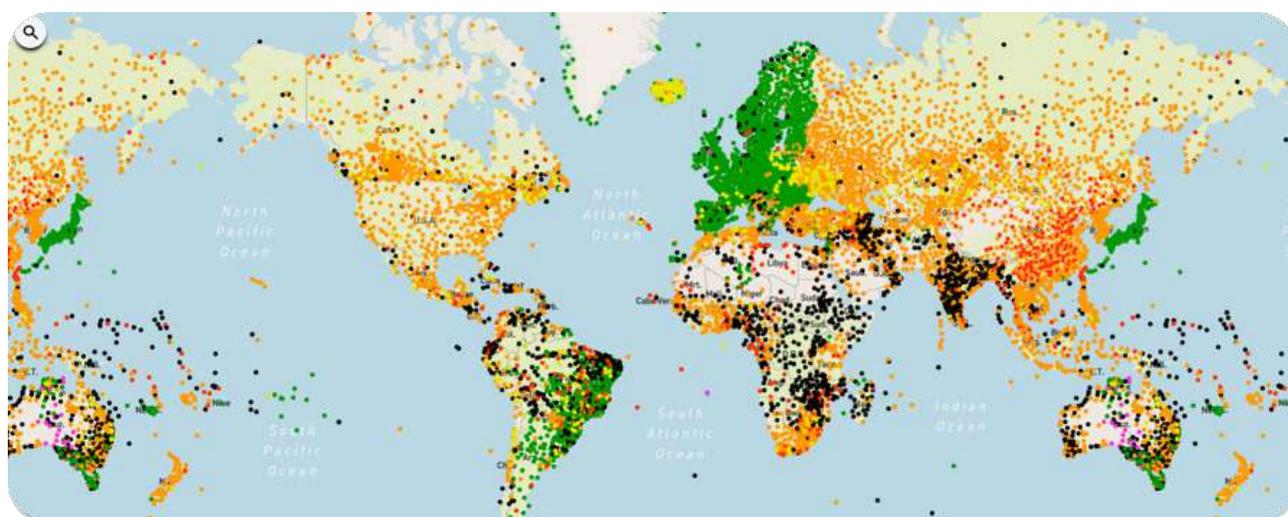


Image 1 Current data availability from observing stations around the globe and their relative compliance with the draft GBON requirements. Source: WQMS, 2020

## THE VALUE OF GBON FOR INVESTMENTS IN RESILIENCE

**To ensure a continuous, robust supply of observational data from all areas of the globe, the World Meteorological Congress approved the GBON concept in June 2019.** GBON sets out an obligation and clear requirements for all WMO Members to acquire and internationally exchange the most essential surface-based observational data at a minimum level of spatial resolution and defined timeframe. GBON is a landmark agreement and offers a new approach in which the basic surface-based observing network is designed, defined and monitored at the global level.

**The implementation of GBON will result in filling the gaps in surface-based observations in data-sparse areas.** It will lead to a more than 10-fold increase of radiosonde observations and a more than 20-fold increase of observations from weather stations in Small Islands Developing States (SIDS) and Least Developed Countries (LDCs). Such data improvements are critical not only for better weather forecasts and climate analysis in these countries but will also create global and regional benefits.

**Improvements in forecast skill will deliver a wide range of economic, environmental, and social benefits** across a range of timescales, from short-term warnings regarding imminent danger to life and property, increasing understanding of local weather patterns, to longer-term projections of climate change that are essential for adaptation and resilience strategies.

**Local forecasting in any given location benefits from improved observations from all over the globe.** The global nature of NWP means that benefits will be realized both in the countries where the improvements are made and in countries where capacities are already high. The required cost to achieve sustained GBON would yield a cost-benefit ratio of 1:26.<sup>2</sup>

**It is estimated that the socio-economic benefits of weather prediction amount to US\$158 billion per annum globally,<sup>3</sup>** when considering disaster management, agriculture, water supply, energy, transportation, and construction, across both the public and private sectors. However, the benefits extend to all sectors and at a macro-economic level through increased business activity, capital and revenue investment, fiscal stability, credit risk management together with environmental and social benefits.

**Ultimately, the implementation of GBON will contribute to increase investments in resilience in the most vulnerable countries, while making overall investments across the globe more resilient.**

## THE ROLE OF THE INSURANCE SECTOR

**The insurance sector plays a vital role in supporting national economic growth, trade and development and for individuals, communities and businesses.** Insurers are typically large investors, contributing to financial stability by providing an affordable and effective risk management measure.

**There is a growing realization that the insurance sector has also an important role in building resilience.** Climate and disaster risk insurance solutions are gaining more and more prominence as risk management tools, allowing for a more timely and reliable response to extreme weather events as well as to better prepare for climate and disaster risks. When insurance products complement ongoing efforts to minimize and address climate and disaster risks, they can be an effective measure to increase local adaptive capacity and strengthen local resilience.

**The insurance industry is a complex sector which involves diverse groups of stakeholders.** Insurance and reinsurance companies offer financial protection against hazards, but the scales in which they operate differ. Primary insurance is purchased by an individual or company to protect against multiple losses including life, health, property, business transactions and liability while reinsurance is essentially insurance for insurance companies. Reinsurers provide protection against extreme events, they are usually more exposed than primary insurers to catastrophic events, such as natural disasters.

**The insurance industry has a strong understanding of weather and climate risks.** The industry is leading the practical application of financial risk management approaches to building resilience to climate change. It is a science-based industry with a long tradition of using and analysing weather data.

## CLIMATE AND WEATHER DATA NEEDS IN THE INSURANCE INDUSTRY

**The economic costs** associated with the frequency and intensity of extreme weather events together with the increasing impacts of climate change pose enormous challenges to the insurance and reinsurance sector.

**The rise in the value of insurance portfolios**, particularly in vulnerable coastal areas creates an increasing exposure and risk of higher economic costs associated with extreme events. In recent years, a number of smaller and mid-sized loss-generating disaster events (so-called secondary perils) accounted for more than 50% of the insured losses.

**The role of insurance as an adaptation risk management measure** in response to climate and disaster risks is stimulating demand for innovative products and the potential expansion of the sector into markets which have traditionally not had a strong 'insurance' culture.

**The changes underway underscore the need for robust climate and weather data** to inform future decision making in the insurance sector. In order to have the ability to assess market potential and changes in market demand, to price risk and evaluate claims; the insurance and reinsurance companies need access to robust, comprehensive, reliable data with historical and spatial coverage.



### What are the benefits of surface-based observations to the insurance sector?

In most cases meteorological and hydrological data is open access. Depending where the knowledge ecosystem members are based in part determines the source of their data. For example, in the USA, the National Centers for Environmental Information (NCEI) of the National Oceanic and Atmospheric Administration (NOAA) is a provider of this indispensable information. Examples of the data and analytical services accessed by the insurance sector include, hurricane track data from satellites and storm data from radar stations to generate and validate catastrophe (CAT models). Daily temperature and precipitation data from NCEI's global knowledge ecosystem of in situ hydromet stations can be used to evaluate the likelihood of drought or winter storms and to verify insurance claims.

NOAA NCEI's Global Historical Climatology Knowledge ecosystem - Daily (GHCN-Daily) dataset integrates daily climate observations from approximately 30 different data sources. It contains station-based measurements from well over 90,000 land-based stations worldwide. Over 25,000 stations are regularly updated with observations from within the last month. The dataset is also routinely reconstructed (usually every week) from the 30 data sources to ensure that GHCN-Daily is generally in sync with its growing list of constituent sources. During this process, quality assurance checks are applied to the full dataset. GHCN-Daily functions as an archive for data from the Global Climate Observing System (GCOS).<sup>4</sup>

## THE GBON VALUE FOR THE INSURANCE SECTOR

**Having access to reliable, accurate data underpins any approach to risk prevention, mitigation and response.** For disaster risk models, in situ observations are an important element of the global weather machine which provides services that have a direct impact on people's lives, such as hurricane track predictions, national forecasts, heatwaves, precipitation, wildfire and weather forecasts.

**The insurance sector uses meteorological and hydrological data for its products and operations.** While it is clear that such data needs to be combined with vulnerability and exposure data, the implementation of GBON will substantially contribute to improve the availability of in situ observational data critical for the analysis of weather hazards.

**GBON data are a building block of weather data, which are the basis for many risk management techniques.** They are the backbone of the underpinning infrastructure of insurance and are essential for capital management and underwriting weather and climate risks, setting insurance premiums, developing parametric products.

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*“Improving hazards data and supporting better results in anticipatory action: The implementation of GBON is fundamental to increase resilience globally through improved weather prediction.”*

Insurance Development Forum (IDF) report (2020) on  
*The Development Impact of Risk Analytics – A call to action for public and private collaboration.*

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## THE INSURANCE SECTOR BENEFITS FROM OPEN ACCESS DATA

**The insurance sector will derive benefit from the implementation of GBON.** Stakeholder engagement reveals that the industry considers that data funded by the public sector should be open access.

**An insurance company creates its own ‘knowledge ecosystem’ to evaluate the potential impact of climate and weather hazards** on a client (including, if the client is a business, its operations and assets). Each knowledge ecosystem brings together sector knowledge, experience and expertise, supported by the company's advanced data, analytics, and partnerships with other innovative companies.

**The data needs of insurance companies are met by a sophisticated and increasingly technologically advanced community of risk analytic providers.** These providers in turn access their data from reliable and robust sources which include NMHS sources, academic and publicly funded research institutions, data archives and their own analytical tools and technology.

**WMO Resolution 40 requires WMO Members to provide essential data and products on a free and unrestricted basis.** Such data are necessary for the provision of services in support of the protection of life and property and the well-being of all nations. The resolution allows WMO Members to place restrictions on the use or re-export of their data for commercial purposes outside of the receiving country (if they so choose).

**Currently, the WMO, in consultation with public and private stakeholders is reviewing this resolution and the modalities for data exchange,** together with corresponding resolutions related to climate and hydrological data. The current development of the new WMO data policy resolution aims to increase the amount of data that are freely and openly available. This is informed by the general trend toward increasingly open data policies adopted by many developed countries and by international efforts.

**The expected outcomes of the review process include achieving a common understanding among all sectors of data exchange** and its role in supporting the global agenda as articulated in the UN Sustainable Development Goals; improving the understanding of the role of the private sector in data provision; and strengthening the links between the private and public sectors. This process provides an opportunity to the insurance sector, and the private sector more broadly, to be engaged in the update of the WMO data policy.



### What is the value of GBON in parametric insurance?

Parametric insurance is a risk solution provided by insurance and re-insurance companies which revolves around a measurable index and is based on predefined triggers or pay out mechanisms, without the need for damage to occur.

As climate-related weather risks become increasingly complex and unpredictable, the requests for such parametric insurance have been increasing. Parametric insurance is also becoming progressively integral to humanitarian approaches to prepare for disasters (Anticipatory Action) and as a means to build resilience.

The implementation of GBON will improve the availability of accurate and reliable hazard data, creating potential opportunities to develop new insurance products in new locations. In addition to contributing to increase the spatial scale of observational data, the implementation of GBON will improve the value of satellite data by enabling more effective calibration of data.

## A CALL FOR ACTION

**GBON is a building block towards a more resilient future, it provides a foundational element to better understand weather hazards and how they are changing over time because of climate change.** GBON is faced with a problem shared with other resilience data needs – securing private sector finance and making resilience investable.

**It is proposed to work through a “Task Force” to develop sustainable investment flows using innovative financing mechanisms,** which would be channeled into the Systematic Financing Observations Facility (SOFF). The Facility will provide technical and financial assistance to sustain GBON compliance and increase access to improved weather and climate products.

**The Task Force would be mandated to establish a model to crowd-in private sector investments in two ways:**

1. Developing innovative financial mechanisms for investments in resilience; and
2. Develop a resilience case to mobilize contributions from the private sector and support from businesses that are willing to be involved in the SOFF, in light of the economic benefits that GBON will deliver (see ‘The value of Surface-based Meteorological Observation Data: Costs and benefits of the Global Basic Observing Network’ information brief for more detail).

**The SOFF is expected to create a new, structured, and results-based partnership** between the beneficiary countries, bilateral and multilateral climate and development finance providers, and private sector contributors.

**The Task Force would serve as a SOFF partner, aiming at the development of a model to ensure consistent annual investment flows into SOFF,** working with the investors from the private sector, including insurers, building relationships and demonstrating the economic GBON value. The Task Force would also contribute to further position the private sector, including the insurance industry, at the core of global efforts to increase resilience, in particular in the most vulnerable countries.



## How does GBON contribute to increasing insurance penetration?

Currently, 98% percent of the disaster load in developing countries is not covered through insurance approaches.<sup>5</sup> In the face of environmental change and a growing number of weather extremes, risk transfer mechanisms, such as climate risk insurance, in conjunction with other disaster risk management measures and strategies, can protect people against climate shocks by acting as a safety net and buffer shortly after an extreme weather event.<sup>6</sup>

Emerging economies account for \$163bn (96%) of the total global insurance protection gap.<sup>7</sup> While many factors contribute to this protection gap, among which the political commitment to a strong public private partnership, having access to reliable data in these countries is a key barrier.

In order for insurance to be provided, for risk to be priced, it is essential that data is also available to assess vulnerability and exposure impacts on receptors (directly and indirectly). Penetration into new markets is also dependent on other factors, including demand, economic environment, digital inclusion, regulatory environment and political partnership.

So far, the insurance sector has been able to access hazard data thanks to the development of the global weather machine. However, the current decrease of data from critical areas in the world, demonstrate the need to implement the GBON to ensure a consistent and continuous data flow as well as to harness the opportunity of significant qualitative improvement.

## WAY FORWARD

**It is proposed that the set-up of the Task Force is spearheaded by a prominent international initiative representing the private sector, including the insurance sector.**

**The Insurance Development Forum and InsuResilience were actively engaged in the initial exploration of the private sector opportunities.** They, along with other stakeholders, recognise the value of GBON as a global initiative where the full benefits can only be secured if there is international action and funding.

**There are several international initiatives working with the private sector** (for example: UNEP Finance Initiative Insurance working group, UN Principles for Sustainable Insurance and UN Principles of Responsible Investment) with shared commitments to sustainable development and finance. The Task Force would explore opportunities to collaborate with existing initiatives and identify possible funding mechanisms.

**The Task Force would be mandated to operationalize the two proposed avenues to mobilize private sector resources,** developing innovative financial mechanisms and a resilience case to mobilize voluntary contributions from the private sector, with the target of achieving this by UNFCCC COP26. The Task Force would also be engaged in the review of the WMO data policy.

**The Task Force would explore opportunities to involve the private sector at large,** beyond the insurance sector. This could include those that benefit directly from weather data for their operations such as courier/logistics, as well as the financial services.

## Endnotes

- 1 European Center for Medium-range Weather Forecast (ECMWF), not considering the further decline during COVID-19 crisis as data comparison is between January 2015 and January 2020.
- 2 Forthcoming World Bank Working Paper on the Value of Surface-based Meteorological Observation Data, 2020.
- 3 *ibid.*
- 4 GBON delivers essential data for the Global Climate Observing System (GCOS) in support of monitoring, analyzing, and understanding the changing climate. GCOS regularly assesses the status of global climate observations of the atmosphere, land and ocean and produces guidance for its improvement.
- 5 Munich Climate Insurance Initiative: [https://climate-insurance.org/wp-content/uploads/2020/06/MCII-VisionMissionStatement\\_final\\_2020.pdf](https://climate-insurance.org/wp-content/uploads/2020/06/MCII-VisionMissionStatement_final_2020.pdf)
- 6 Lloyd's: <https://www.lloyds.com/news-and-risk-insight/press-releases/2018/10/emerging-economies-have-160bn-insurance-gap>
- 7 *ibid.*

## SPECIAL THANKS TO:

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## FURTHER RESOURCES:

SOFF

[Follow link here.](#)

Alliance for Hydromet Development

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WMO

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