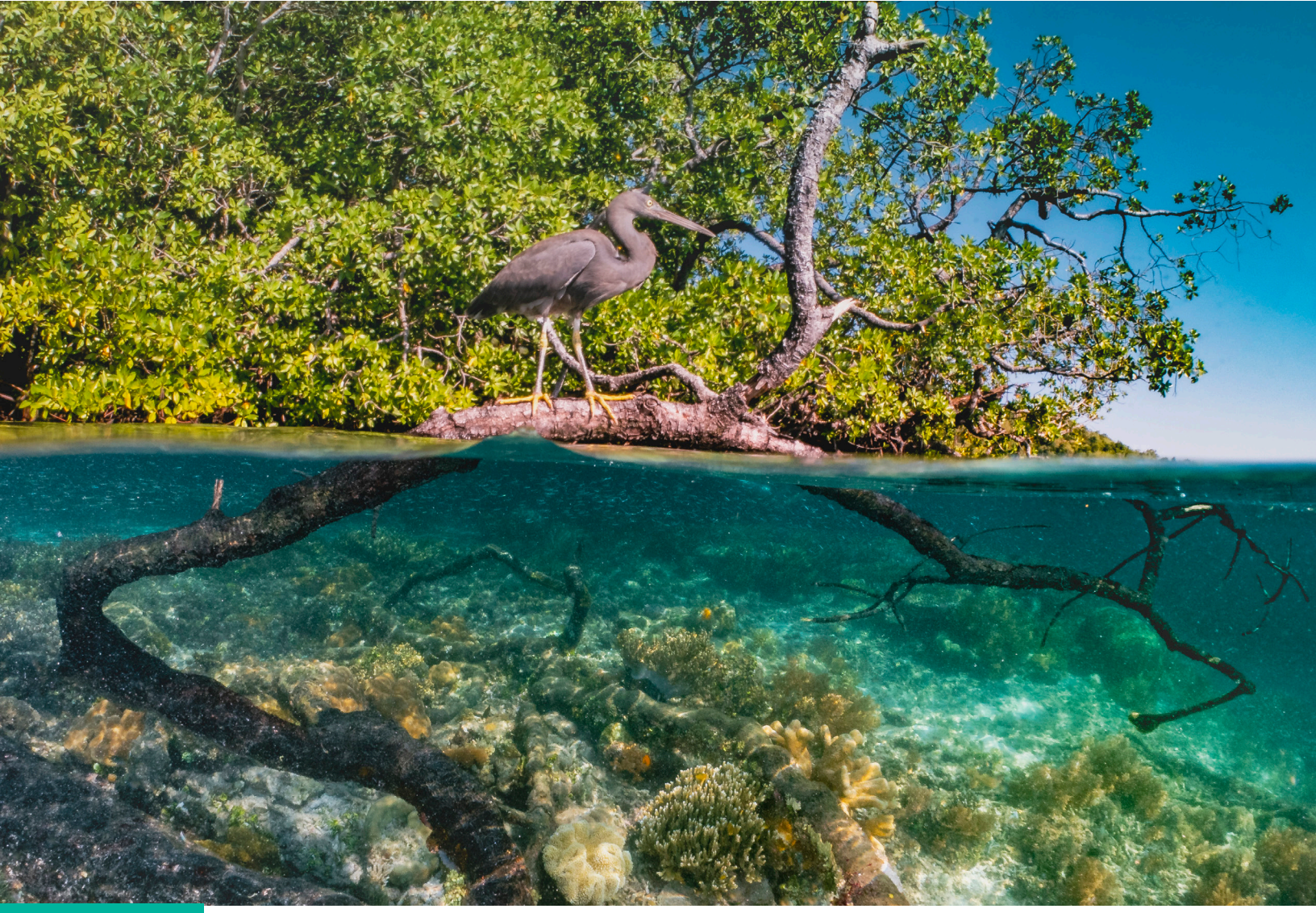


ISSUE BRIEF

Photo: iStock/ Wan Yong Chong

Funding the Race to 30×30: Parametric Insurance

Prepared by Our Shared Seas
May 2025
OurSharedSeas.com

With just five years remaining to reach the ambitious 30×30 target agreed to at biodiversity COP15, practitioners and governments are increasing their efforts to protect 30% of nature by 2030, including 30% of the ocean. As the clock winds down on this unprecedented goal, one question looms large: how do we sustainably fund this work today and into the future?

To help answer this question, Our Shared Seas has produced a three-part series analyzing opportunities to sustainably finance and derisk 30×30 in the marine environment. With a median per-year cost for marine 30×30 estimated at 10.7 billion USD,[1] the task at first appears daunting; however, when compared with the ocean's global annual value of 2.5 trillion USD and a benefit/cost ratio of 1.4–2.7 for marine protected areas (MPAs), it quickly becomes clear that protecting 30% of the ocean is more than a just a conservation imperative—it is a rational economic investment.[2]

This issue brief explores **parametric insurance for ocean ecosystems**—an innovative method to provide economic safety nets in the form of insurance payouts for marine and coastal ecosystems and the economies that rely on them.

Parametric Insurance for Ocean Ecosystems Basics

What it is: A type of insurance that pays out when specific and measurable event conditions or parameters occur (e.g., wind speed exceeding a certain threshold during a storm event)

What it funds: Ecosystem restoration following a shock, risk buffering for payments to protect delicate ecosystems, incentivizing more sustainable industry

Where it's happened: Mexico, Belize, Guatemala, Honduras, Fiji, Hawai'i, Philippines

Scale of parametric insurance to date: Difficult to determine, please **see footnote**.[i]

What is needed to advance the industry: Greater understanding of risk and parametric insurance's value among coastal users; trials of novel parametric insurance use; monitoring, reporting, and verification (MRV)

---

i Global estimates of total scale of parametric insurance remain difficult to obtain, both in terms of total number of policies issued to date as well as total value of payouts. This is due to the private nature of the data (details on policies are not always publicly available). The five programs that we have been able to identify, which may have one or more policies, are the MAR reef insurance policy, the Quintana Roo reef insurance policy, the Philippines' small-scale fisher policy, the Philippines' MPA policy from Axa, and the catastrophe insurance for Belize's blue bond. Depending on how one defines "parametric insurance for coastal ecosystems," the boundary around which policies are included can fluctuate. Using desktop research, CEA calculated a minimum estimate of approximately ~1.4 million USD in payouts, but experts note this figure requires further investigation.

Background: What is Parametric Insurance?

Parametric insurance is a type of insurance policy that utilizes a novel payout method to quickly move money to policyholders following an environmental shock. It can be applied to any area that is prone to environmental shocks. The first part of this issue brief describes parametric insurance broadly, not only as it applies to marine and coastal areas; the remaining sections focus on parametric insurance in the marine and coastal contexts.

Parametric Insurance: General Concept

Parametric insurance emerged in its modern form in the 1990s and has grown significantly in the last few years as climate instability increases. As compared to traditional insurance (also known as indemnity insurance), parametric insurance provides faster payouts following natural disasters, making it a useful tool for industries and individuals located in areas with high likelihoods of climate shocks (e.g., floods, droughts, storms). The reinsurance company Swiss Re valued the global parametric insurance industry at 11.7 billion USD in 2021 and estimates this value could grow to 29.3 billion by 2031.[3] Application of parametric insurance is growing particularly in locations experiencing increased risk of climate disasters. For example, the recently launched FloodFlash provides parametric insurance for property owners in flood-prone areas of the U.S.[4]

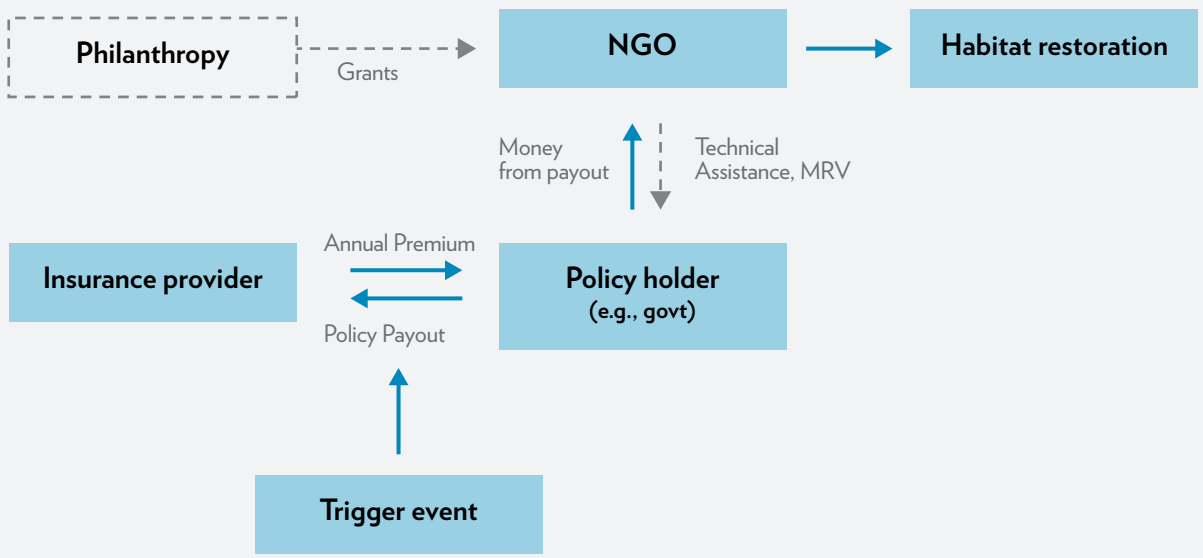
As coastal habitats and economies face increasing threats from climate shocks, parametric insurance is emerging as a tool to support adaptation. Entities with an insurable interest (often a direct or indirect financial stake) in the preservation of an ocean habitat or a blue industry dependent on that habitat can buy an insurance policy that will pay out in the event of a natural disaster that damages the ecosystem or disrupts the industry. Use of payments is usually unrestricted, but it often funds restoration of the damaged habitat or provides emergency capital for local business owners whose livelihoods have been disrupted.

Parametric insurance provides similar risk transfer benefits as traditional insurance, but unlike traditional insurance, payout amounts from parametric policies are not determined by assessing the damage to an asset. Rather, parametric insurance payouts are pre-determined and triggered by environmental conditions that signify a particular environmental hazard. For instance, a parametric insurance policy may pay its policyholder when a minimum wind speed occurs during a storm event. The payout amount can vary depending on the intensity of the environmental condition, with payout amounts increasing for events that are likely to cause more damage (e.g., the payout may be 60% of the policy limit for a category 3 hurricane and 100% of the limit for a category 5 hurricane). These pre-arranged payouts allow capital to flow more quickly to a policyholder following a storm event; this in turn allows time-sensitive restoration and disaster recovery efforts to happen more quickly.[5]

The diagram below outlines one possible setup for a parametric insurance plan that covers an ecosystem. The diagram is modelled off the Quintana Roo reef insurance policy, which itself is described in more detail in the case study section. Please note this diagram is an illustrative example; there is no strict framework that all parametric insurance policies adhere to. In general, the core components necessary for a parametric insurance policy are a policyholder who pays a premium to an insurer and an insurer who pays out funds to the policyholder following a qualifying environmental metric. In **Diagram 1**, restoration is the example use of funds, but this could be replaced by any expense the policyholder has—parametric insurance is applicable to any activity or location that may be disrupted by climate shocks.

Dashed boxes note where philanthropic and NGO support is a useful, but not inherently necessary, component of the policy development. Solid boxes indicate where the role of NGOs/ Philanthropy is a critical component of the process.

Diagram 1. Illustrative example of possible structure of a parametric insurance policy for coral reefs



Dashed boxes note where philanthropic and NGO support is a useful, but not inherently necessary, component of the policy development. Solid boxes indicate where the role of NGOs/Philanthropy is a critical component of the process.

Parametric Insurance in Coastal and Marine Contexts

In coastal and marine contexts, parametric insurance has been used to advance the health of ocean ecosystems by derisking multiple types of activities, including restoration, sustainable ocean industries, or investments in ocean protection. Importantly, its role—like all insurance—is in mitigating risks, not serving as an additional source of financing. In the long-term, policyholders should expect to pay more in insurance premiums than they receive in payouts—this structure is inherent in all insurance policies. Thus, parametric insurance is a useful tool for risk transfer in the face of rising climate uncertainty and for mitigating risks associated with investment in coastal ecosystems and sustainable blue industries, but it is not a method to crowd in more funding for ocean conservation.

All remaining sections will be specific to parametric insurance as it pertains to ocean and coastal ecosystems.

Successful Applications

Parametric insurance has both direct and indirect applications to advancing ocean conservation and habitat protection. **See Table 1**.

Table 1. Summary of various direct and indirect roles parametric insurance can play in advancing habitat protection and status

Role	Direct or Indirect	Status	Description
Restoration	Direct	Exists	Payouts are used to support the restoration of damaged habitats following a shock to the system (such as storm damage). This is the most common use of parametric insurance for marine ecosystems.
Risk reduction for sustainable industry or blue bonds	Indirect	Exists	A parametric insurance policy can help reduce the risk of investing in sustainable industry or blue bonds, as the value of the asset can be restored/maintained using payouts from the insurance.
Improved ecosystem management	Indirect	Upcoming Pilot	Receipt of payments from parametric insurance can be contingent on improved ecosystem stewardship, thus incentivizing more sustainable behavior.

Reactive Restoration

Parametric insurance can provide a safety net of rapidly available capital for unexpected "reactive" projects, particularly those that arise from climate stressors or shocks. These projects allow policyholders to quickly receive financial compensation and support following a natural disaster.[6] This can be particularly useful for protected areas that are expected to undergo increasing damage due to climate change. For example, some of Hawaii's coral-containing MPAs are currently covered by a parametric insurance plan that pays out for restoration following storm damage.[7] As MPA management costs become more unpredictable due to more frequent shocks to the ecosystem (e.g., hurricanes), parametric insurance can help provide risk transfer that mitigates some of this uncertainty, guaranteeing rapidly available funds after a shock.

Risk Mitigation for Habitat Protection

Parametric insurance can serve as a risk-transfer agent for more proactive investments in habitat protection, particularly blue bonds. If a government or other entity is locked into a sustainable, habitat-related investment, such as a blue bond, the parametric insurance can cover their payments should that entity face an environmental shock that makes it difficult for them to stick to their regular payment schedule. For example, Willis Towers Watson (WTW) designed a parametric insurance policy that protects Belize's blue bond payments. If a qualifying natural disaster strikes, the Belize government's debt payment obligation is waived, and the insurance policy will cover the payment instead, protecting both the government of Belize and investors in the blue bond.[8] This demonstrates how parametric insurance can buffer risks associated with investing in area protection. This product could be expanded to cover any debt obligation for a nation prone to climate shocks that could reduce their ability to service debts.

Incentivizing Ecosystem-based Management

Although reactive disaster response has been the primary use of parametric insurance for coastal ecosystems, these policies could be used to incentivize forward-looking sustainable management. In the Philippines, an upcoming pilot parametric insurance program will compensate fishers for lost fishing days due to climate change. The program only benefits registered fishers, with fisher registration fees helping to finance the plan (in addition to government agency budgets). Thus, the policy incentivizes registration of fishing vessels, which is an important step towards sustainable ecosystem-based management.[9] Emergence of this new application suggests a larger potential role for parametric insurance to incentivize and derisk sustainable blue economy development in an increasingly unstable climate.

Concerns, Limitations, and Unanswered Questions

While parametric insurance holds promise for supporting the tools that finance 30×30, there are still many questions regarding where and how to apply it. **Table 2** summarizes some of the key limitations, which are important considerations for how and in which contexts to successfully apply parametric insurance as a solution.

Table 2. Limitations of parametric insurance as a solution and the relative significance of this limitation in 30×30 applications

Limitation/challenge	Significance	Impact Description
Not a net source of funding	High	Parametric insurance policyholders should expect to pay more in premiums than they receive in payouts; thus, parametric insurance does not actually crowd in net funding for ecosystems or sustainable ocean industry.
Only works for select habitats	Moderate	Parametric insurance is only applicable to coastal ecosystems where individuals or entities have an insurable stake in the ecosystem's status.
Difficulty of attracting private finance	Moderate	While surmountable, this challenge has resulted in some parametric insurance policies relying on donations to support their premiums.
Annual renegotiation	Moderate	Regular renegotiation and purchase of the premium for the insurance policy require on-going financial support and can lead to policy changes if adequate funding is unavailable.
Complexity of developing the policy	Moderate	Unlike traditional indemnity insurance, parametric insurance for ecosystems does not come "off the shelf" and requires substantial investment of monetary and human resources to design.
Absorptive capacity of restoration organizations	Low	Organizations may not have enough trained or available practitioners to quickly and effectively put payouts into action, but this challenge can be overcome through a well-planned policy.

The primary limitation of utilizing parametric insurance for marine 30×30 is that it cannot directly fund proactive protection measures (e.g., MPA establishment and monitoring), and it does not bring in positive net funding over its lifetime. Payouts from parametric insurance are a reaction to environmental conditions, and as an insurance policy, the total cost of premiums will outweigh the total value of payouts in the long-term.[10] On its own, it would be impossible for this mechanism to fund the expansion of protected areas toward 30×30. Rather, experts suggest that parametric insurance should be thought of as a risk transfer mechanism in addition to traditional financing mechanisms, utilized to buffer riskier investments in habitat protection from natural disasters.

Scaling the uptake of parametric insurance is also limited because developing a policy for an ocean ecosystem is complex and time/resource intensive. Unlike other insurance policies, particularly indemnity policies, which can largely come "off the shelf," each parametric insurance policy requires significant time and capital to develop. This can be a limiting factor if a potential policy holder does not have the expertise, capital, or time to invest in developing the policy.

As discussed below, covering these costs is a ripe opportunity for philanthropic dollars.

There are also some risks associated with the robustness and stability of parametric insurance. The primary concern is basis risk, which arises when the payout amounts do not match the loss incurred. Because payouts are pre-set to allow for more rapid resource mobilization, there is a tradeoff between releasing funds quickly and accurately matching the scale of funding to the scale of damage.[11] Basis risk can result in mismatch in either direction: a payment may be lower than the amount needed to meet restoration needs, but it may also be higher than required, which could lead to additional funds available for on-going conservation (including future premium payments).

The insurance market itself is also prone to fluctuations, which could contribute to uncertainty in the pricing of parametric insurance. In the U.S., some disaster–prone areas have witnessed a sharp increase in insurance premiums or, in some instances, companies completely refusing to cover property with traditional indemnity insurance in whole areas that have been deemed "too risky."[12] As climate-related disasters, such

as hurricanes, become more frequent and more severe due to climate change, the costs and risks of insuring marine habitats and their industries will likely increase; this could lead to decreasing coverage, increasing policy premiums, or the wholesale loss of policies.[13]

A second, smaller challenge associated with the insurance market is that insurance policies generally run for one- to three-year periods, making renewal and renegotiation an ongoing process; in some instances, such as the case study highlighted below, renegotiation has led to decreased area coverage for their plan.[14] This can reduce the longevity and reliability of parametric insurance, although experts note that other policies have successfully endured for many years.

Additionally, complexities arise when trying to incentivize private companies to pay for parametric insurance premiums. While many businesses rely on healthy ecosystems for their revenues (e.g., hotels that rely on reef tourism), it can be difficult to calculate exactly how a parametric insurance policy buffers these businesses from economic losses following ecosystem damage. For instance, in the example of a hotel whose tourism depends on a coral reef, it is challenging to quantify exactly how much their economic risk will be reduced by investing in parametric insurance. For this reason, private funds supporting parametric insurance for ecosystems have not regularly materialized, leading some policies to rely on grant capital.

Lastly, representatives from organizations that conduct restoration have described challenges with being able to onboard enough restoration practitioners quickly after a disaster to engage in large-scale response efforts. The number and availability of restoration professionals, particularly divers, has been more of a bottleneck than available funding in some instances of restoration, and it is conceivable that, even if there were enough interest to purchase parametric insurance, there may not be enough human resources to absorb payments for and conduct restoration services. However, proper design of a parametric insurance policy and proper planning for payouts can eliminate this risk and ensure that payouts are fully utilized.

Philanthropy's Role

To date, private philanthropy's primary role in parametric insurance for marine ecosystems has been supporting organizations that help insurance agencies and beneficiaries design policies and implement response activities when the policy pays out. Indeed, NGOs' involvement in raising the profile of parametric insurance has helped spur other actors to investigate the potential of this tool. Philanthropy's ongoing support of these NGOs thus remains a critical component of further developing parametric insurance for ecosystems.[15]

Another key challenge well-suited to philanthropic investment is de-risking what remains an emergent and uncertain solution space. Because the blue parametric field is nascent, there is not enough precedent or momentum yet for parametric insurance to be considered as a mainstream, economically rational choice for coastal industries, communities, and governments. De-risking can include financing premiums for novel parametric insurance policies and testing and proving policies, which are necessary steps to ensure policies' efficacy and efficiency.[16]

Philanthropy's risk tolerant capital can help derisk this field by supporting NGOs that are designing and implementing these policies and/or by funding small, pilot versions of these policies. The pilot parametric insurance policy for small-scale fishers in the Philippines harnesses both uses of philanthropy—the project's design and premium payments have been partially funded by grants from the Ocean Risk and Resilience Action Alliance (ORRAA) and the government of Canada.[17]

For ocean conservation applications, parametric insurance serves not as a funding mechanism in and of itself, but as a method to safeguard investments in marine area-based protection from risk, particularly the risk of shock events. This security can help ensure that MPAs maintain adequate liquidity after an environmental shock, and it can provide assurance to funders that the protected area is not at risk of complete loss in the face of a shock. Both of these functions can help to advance 30×30 goals by reducing the perceived and real risk of investing in MPAs under a climate-impacted future.

Case Studies

Coral Reef Insurance for the Mexican State of Quintana Roo

In 2018, a constituency comprising the government of the Mexican state of Quintana Roo, local coastal hotels, and The Nature Conservancy (TNC) developed the first parametric insurance plan for a coral reef. Initially, the partners agreed to utilize a portion of the hotels' property taxes to support a conservation-focused trust, the Coastal Zone Management Trust (CZMT), which stewards a stretch of the Mesoamerican Reef. The logic underpinning this arrangement was that the reef and beaches are a key driver of tourism, fisheries, and storm surge protection, so both coastal businesses and the government have a strong economic incentive to protect them. The argument was that the policy would support not only a functional ecosystem, but the businesses that paid for it. However, money from property taxes never materialized, and the policy has since relied on grant-based financing.

Managed by a combination of the state government, scientific experts, NGO staff members (including from TNC), and hotel association representatives, CZMT gives a portion of its money (now philanthropically funded) to the state government to purchase parametric insurance covering approximately 100 miles of the reef and adjacent beaches. Although CZMT provides the funds, it is the government, rather than CZMT, who is the policy holder as they purchased the policy from reinsurance provider Swiss Re.

The plan pays out when wind speeds reach 100 knots during a storm event. The payment amount increases with wind speed, until it hits a payout limit. Immediately following the storm, the maximum wind speed is assessed, and a corresponding payout amount is determined. The funds are then disbursed within three weeks to support a rapid response. A team of reef restoration practitioners, hired by CZMT, assesses damage to the reef and begins restoration efforts.

In 2020, Hurricane Delta triggered the insurance plan. Swiss Re paid out 800,000 USD, which enabled 80 responders to act on the damage within Puerto Morelos National Park. The team stabilized 1,200 large coral colonies and transplanted 9,000 coral fragments. In addition, the insurance money supported small scale coral restoration efforts in Cancun, Nizuc, and Isla Mujeres National Park.

However, experts note that several issues arose following Hurricane Delta. While Swiss Re paid out quickly, the money was held up in the State of Quintana Roo, and restoration practitioners were forced to utilize emergency funds from alternative sources. Additionally, because of difficulties with securing financing for premium payments, some of the payout from Swiss Re was ultimately redirected back into premium payments.

In the years since the 2020 event, the policy was renegotiated, leading to a reduction in the area covered (and a corresponding reduction in the premium).[18] In 2024, the policy was triggered again following the impacts of Hurricane Beryl, although at a lower level (430,000 USD), with many applauding the policy's successful rapid deployment of capital for reef restoration.[19]

This case study highlights parametric insurance's potential ability to bring capital to ecosystems rapidly after a disaster. Without this plan, rapid-response capital for coral reef rehabilitation may have been unavailable, and rehabilitation efforts likely could not have occurred with the same pace or level of intensity. Further, while the policy needs to be renewed every year and has required renegotiation, the insurance program broadly has survived for six years. This lifespan indicates how parametric insurance can be a largely dependable source of emergency funding for MPAs, even if it is subject to the shifts of 1-year policy periods and the inherent instability of the insurance market.

The Quintana Roo insurance policy was a successful proof of concept; TNC has since worked with insurance provider WTW to develop a similar policy for Hawaiian coral reefs. Separately, the Mesoamerican Reef Fund (MAR Fund) and WTW designed and launched the MAR Insurance Programme which has existed for 4 years and grown from four reef sites to now supporting ten sites along the 1,000 km of endangered reefs spanning Mexico, Belize, Guatemala, and Honduras. This policy paid out 175,000 USD in 2022 following Hurricane Lisa's impacts on Turneffe Atoll.[20]

Photo: Philip Hamilton / Ocean Image Bank

Insurance for Lost Fishing Days in the Philippines

As climate change yields increasingly frequent and damaging storms in coastal areas, fishers' livelihoods grow more and more unstable due to lost fishing days and damaged gear. This is a particularly grave threat in countries like the Philippines, where fish and fish products comprise over 11% of an average citizen's diet and 6.5 million people rely on fisheries for food and livelihoods. Further, climate change compounds existing threats to seafood sustainability; the Philippines is plagued by unsustainable fishing, particularly Illegal, Unreported, and Unregulated (IUU) fishing, which composes up to 40% of annual landings in the Philippines.

To protect small-scale fishers in the Philippines against mounting climatic stress while incentivizing more sustainable and transparent fishing practices, Rare and WTW are designing a parametric insurance product to support small-scale fishers in the Philippines impacted by "bad weather" periods exacerbated by climate change. High windspeed, heavy rainfall, and higher wave height reduce visibility and make fishing in smaller vessels treacherous and dangerous; when these conditions occur, fishers in the program will receive parametric insurance payouts to compensate for lost fishing days.

Based on experiences of small-scale fishers, the product considers the actual weather conditions that result in significant income losses. Specifically, the product index combines three weather parameters (wind speed, wave height, and rainfall) into a single index that is triggered by the "badness" of the weather for fishers over a five-day period (as defined by the three metrics), relative to what would be expected based on previous experience.

In terms of institutional arrangements, the Department of Agriculture—Bureau of Fisheries and Aquatic resources (DA-BFAR) has set aside money from its budget to pay for the premium and will serve as the policyholder. The beneficiaries, selected via lottery, will comprise 15–20 thousand fishers across four to five states.[21] To be eligible for the lottery, fishers must be registered with their local government unit and committed to certain sustainable fishing principles. Thus, this policy not only improves the climate resilience of vulnerable populations in the global south; it also encourages improved environmental stewardship via financial incentives that reward transparent and sustainable fishing.

Photo: iStock/Dan-Manila

To learn more, visit Our Shared Seas:

https://oursharedseas.com/

Endnotes

1 The estimated range for annual cost if 5–19 billion USD

2 https://wedocs.unep.org/bitstream/handle/20.500.11822/40275/MPA_Finance.pdf?sequence=3&isAllowed=y

3 https://corporatesolutions.swissre.com/insights/knowledge/evolution-of-parametric-insurance.html#:~:text=increasingly%20risky%20environment.-,The%20beginnings,insurers%20started%20offering%20parametric%20products.

4 https://floodflash.co/us/

5 https://corporatesolutions.swissre.com/insights/knowledge/what_is_parametric_insurance.html

6 https://climate.axa/marine-protected-areas-blue-finance/

7 https://www.nature.org/content/dam/tnc/nature/en/documents/2024_Hawaii-Reef-Insurance-fact-sheet.pdf

8 https://www.wtwco.com/en-hr/insights/2022/09/wtw-designed-parametric-solution-protects-belizes-blue-bond-debt-servicing-from-climate-disasters

9 https://www.unepfi.org/wordpress/wp-content/uploads/2023/06/UNEP-FI-Case-study_Parametric-Insurance-for-Small-Scale-Fishers.pdf

10 https://www.pewtrusts.org/-/media/assets/2022/07/funding-the-big-blue-offshore-and-high-seas-marine-protected-area-finance.pd

11 https://hive.greenfinanceinstitute.com/gfihive/revenues-for-nature/case-studies/quintana-roo-reef-protection-parametric-insurance/

12 https://www.bbc.com/future/article/20240311-why-climate-change-is-making-the-us-uninsurable

13 https://www.edf.org/climate/how-climate-change-makes-hurricanes-more-destructive.

14 https://hive.greenfinanceinstitute.com/gfihive/case-studies/quintana-roo-reef-protection-parametric-insurance/

15 https://hive.greenfinanceinstitute.com/gfihive/case-studies/quintana-roo-reef-protection-parametric-insurance/

16 https://www.nature.org/content/dam/tnc/nature/en/documents/2024_Hawaii-Reef-Insurance-fact-sheet.pdf

17 https://rare.org/stories-articles/insuring-the-ensurers-rares-fish-forever-program-protects-the-fishers-who-feed-the-world/

18 https://hive.greenfinanceinstitute.com/gfihive/case-studies/quintana-roo-reef-protection-parametric-insurance/

19 https://www.insurancebusinessmag.com/us/news/reinsurance/skyline-partners-munich-re-issue-payout-for-hurricane-beryl-in-jamaica-504156.aspx

20 https://icriforum.org/first-reef-insurance-payout-belize/

21 https://oceanriskalliance.org/project/weather-index-based-parametric-insurance-for-small-scale-fishers/

Suggested citation:

Saliman, A., Hardt, M. "Funding the Race to 30×30: Parametric Insurance." Our Shared Seas, 2025.

This report was made possible with support from Oceans 5, a sponsored project of Rockefeller Philanthropy Advisors.