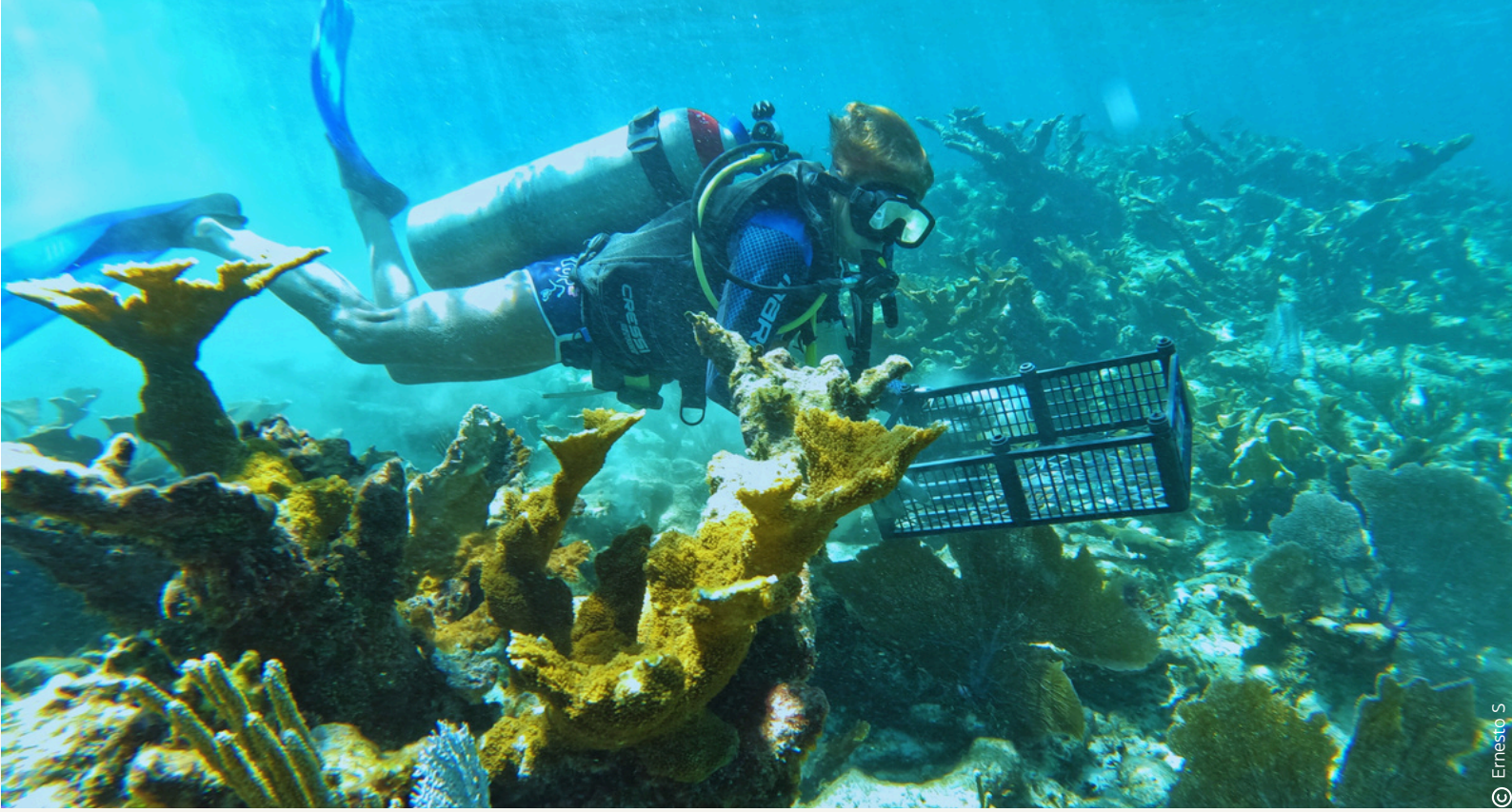

CASE STUDY

Mesoamerican Reef Insurance Programme

InsuResilience Solutions Fund

2025

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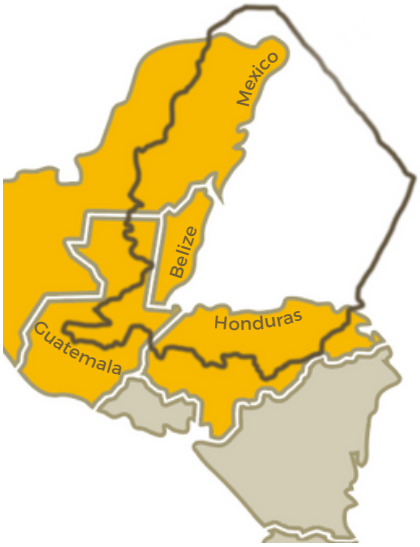
OVERVIEW



OBJECTIVE

The overarching objective is to enhance the climate resilience of the coral reefs and coastal communities across several Caribbean coasts that depend on healthy reefs and the ecosystem services they provide, including coastal protection, productive fisheries, and blue economy livelihoods opportunities. Through implementing parametric wind speed insurance, the solution covers response costs for reef restoration, along with improved risk understanding.

PROJECT CHARACTERISTICS

Target group
Coastal communities depending on healthy reefs and the benefits they provide (e.g., coastal protection, productive fisheries, blue economy livelihoods, etc.)

Target region
10 Reef sites on the Caribbean coasts of Mexico, Belize, Guatemala, and Honduras

Insured asset
Coral reefs and respective reef response and restoration costs

Insured peril / hazard
Hurricane-force windspeeds

Insurance type
Meso- scheme
Development of a new parametric wind speed insurance

Partnership
The Mesoamerican Reef Fund (MAR Fund)
Willis Towers Watson (WTW)
AXA Group

Project timeline
May 2021 - January 2025

OUTCOMES

- A new parametric insurance product, covering hurricane-related reef damage, was developed and placed across 10 reef sites (protected areas), providing a formal risk transfer mechanism to enhance the climate resilience of coral reef ecosystems and the communities that depend on them. The insurance was piloted at 4 sites in the first year, with an original target of 7 sites. By the end of the project, this target was surpassed, reaching a total of 10 sites.
- The geographic expansion of the insurance programme has been driven by expansions in reef response capacities, with reef response teams trained and organised in each location before insurance placement. These included certified Reef Guardians and Reef Brigades made up of local community members, government officials, tourism providers, and reef co-managers. This helped build local response capacity as a prerequisite for insuring additional reef sites.
- Following Hurricane Lisa in 2022, insurance payouts were used to mobilise coordinated local response groups for rapid reef repair and restoration at Turneffe Atoll, Belize. Participation in these efforts provided a contingent income source for trained community members involved in the response.

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PROJECT SUMMARY

The Mesoamerican Reef Region (MAR), the world's second-largest coral reef system, stretches along the coasts of Mexico, Belize, Guatemala, and Honduras. It provides essential ecosystem services such as coastal protection, fisheries support, and tourism-based livelihoods. However, the reef is increasingly vulnerable to the impacts of climate change, especially stronger and more frequent hurricanes that damage reef structure and reduce its protective functions. Coastal communities throughout the MAR region depend heavily on the reef for their safety and economic well-being.

To address this challenge, MAR Fund, a regional environmental fund, whose main objective is to contribute to the conservation, restoration, and sustainable use of the Mesoamerican Reef Region, in collaboration with global insurance broker, Willis Towers Watson (WTW), developed a regional parametric insurance product specifically designed for coral reefs. The insurance is triggered by wind speed, used as a proxy for hurricane-related damage, enabling quick payouts to support organised reef response. The scheme covers 10 coral reef sites in four countries and targets beneficiaries such as coastal communities, local tourism operators, fishers, and public institutions. Communities benefit indirectly through the restoration of reef sites, which helps secure income from tourism and fishing, and directly through their inclusion and training as members of local Reef Brigades.[1] The project involved detailed hurricane risk modelling, actuarial pricing, and the development of clear policy terms and efficient payout mechanisms. Public engagement, awareness-raising, the certification of Reef Guardians and formation of Reef Brigades helped build institutional readiness and public trust.

Ongoing work focuses on identifying sustainable premium financing mechanisms and funding sources, including potential capital funds, contributions from governments, conservation partners, reef-dependent businesses, and reef managers.[2] This project provides a pioneering example of how insurance tools can be applied to protect natural assets, strengthening climate resilience and delivering long-term benefits for both ecosystems and the people who depend on them.

PROJECT STRUCTURE

ISF PROJECT PARTNERS

BENEFICIARIES	MAR FUND	wtw	AXA
Direct • Countries (Caribbean coasts of MX, BZ, GT and HN) • Emergency responders (Reef Guardians and Brigades) **Indirect** • Coastal communities	• Policy holder • Capacity building • Facilitates the distribution of the payout • Fosters partnerships • Facilitates funding	• Payout Structure Design • Product Placement • Risk Advisory & Consulting • Calculation Agent	• Insurance company • Risk taker • Payouts

[1] Reef Brigades are trained local response groups that mobilise immediately after tropical storms to repair and restore damaged coral reefs. Their activities include clearing debris, reattaching corals, stabilising reef structures, and coordinating recovery efforts with local authorities.
[2] Reef managers are organisations formally responsible for the administration and conservation of reef sites, often under co-management agreements with government. They oversee day-to-day management and act as institutional partners for the reef insurance programme.

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KEY TAKEAWAYS

- **Pre-arranged insurance** enabled rapid reef response after hurricanes, improving coral survival and ecosystem recovery.
- **Collaboration among multi-stakeholders** such as governments, reef managers, communities, and insurers created shared ownership and smoother implementation.
- Integrating insurance with **reef restoration and institutional capacity building** strengthened outcomes and willingness to pay for insurance and overall climate resilience in the region.
- **Demonstration payouts** (e.g. after Hurricane Lisa at Turneffe Atoll, Belize, 2022) proved the value of the insurance model, building stakeholder confidence and interest in expanding the approach to other sites.
- **Competitive reinsurance** terms were secured as reinsurers recognised the environmental and social impacts of the initiative.
- An endowment fund model was developed by MAR Fund to ensure **long-term sustainability of premium** payments and reduce reliance on unpredictable, short-term donor contributions.
- International, national, and local reef stakeholders have indicated willingness to contribute to raising and **co-financing reef insurance premiums** when the value of post-hurricane reef response is clearly demonstrated.

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LESSONS LEARNED

WILLINGNESS AND ABILITY TO PAY

- **Willingness to pay insurance premium varies across the region.** While national and local stakeholders in Mexico, Belize, Guatemala, and Honduras are supportive of the programme and willing to contribute, they are often reliant on external support for investments in climate resilience and ecosystem health.
- The **design of the insurance product**, particularly its clear link to reef response, increases its perceived value and enhances stakeholder willingness to pay.
- Investments in **institutional reef response capacity** (including trainings of government agencies, reef area managers, and civil society organisations on emergency reef response) also strengthened local support for the programme. For example, response committees are increasingly emphasising the training of staff who can be deployed effectively in an emergency.
- Reef area managers often use the revenue from **visitor fees** to finance investments in ecosystem health. While existing revenue streams are fully committed, these types of mechanisms could be further developed to finance insurance premium payments, based on the ability and willingness of commercial and recreational reef users to contribute. Engagement with tourism operators strengthens this potential.
- Some of the ecosystem benefits provided by healthy reefs, such as global environmental value, regulatory functions, or cultural significance, are difficult to monetise. This presents a **challenge in building a financial case** for premium contributions based solely on measurable economic returns.

CLIENT VALUE

- In November 2022, the **first payout of USD 175,000 was triggered** when Hurricane Lisa struck Turneffe Atoll in Belize. Funds were disbursed to the Turneffe Atoll Sustainability Association (TASA) through MAR Fund's Emergency Fund. TASA, the local reef site manager, coordinated trained brigade members to carry out rapid reef assessments, coral stabilisation, and restoration activities (Link).
- The payout was distributed through a grant process based on a submitted technical proposal and budget, with follow-up disbursements linked to continued restoration and monitoring work. The **payout validated the insurance product's role** in enabling timely and effective action and thus reinforcing **client trust** and **confidence in the product.**
- Pre-arranged financing not only accelerates reef response but also improves **coordination and collaboration among stakeholders** and enhances overall response effectiveness.
- The insurance product is designed to evolve based on updated response cost data and past payout experiences, showing **responsiveness to client needs** and on-the-ground realities.
- **Aligning insurance cover with response capacity strengthens value.** Insurance payouts are designed to match what Reef Brigades can realistically implement, ensuring funds are used effectively and reinforcing stakeholder trust.
- The expansion of the insurance solution to **new reef sites and countries** reflects its perceived value by stakeholders, who view it as adaptable and relevant across diverse contexts.
- The **project's continuation despite political changes** in participating countries suggests that clients and stakeholders see value in its stability, relevance, and non-partisan design.
- Incorporating gender considerations into outreach strategies helped ensure more **inclusive participation** in reef insurance programmes.

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TECHNOLOGY

- Defined communication channels, such as **WhatsApp and local response groups**, supported timely and transparent communication about insurance triggers and payouts.
- **A tailored methodology** to estimate the costs of stepped levels of reef response at different reef sites depending on reef response plans, response capacity available at each site, and the duration of the response helps optimise the design of the insurance product and payout structure, so that it is both effective and cost-efficient.
- **Technical collaboration with insurance specialists**, such as WTW, improves the integration of advanced modelling and risk tools into the insurance process, enhancing product quality and credibility. Further technical details on the parametric modelling, Cat-in-Nested-Circles trigger structure, and site-specific payout levels are available in the WTW-IDF Case Study (2025).

LEGISLATIVE / ENABLING ENVIRONMENT

- With **over 20 years of engagement** with national and local governments, MAR Fund has developed a strong reputation as a well-governed institution with sound administrative mechanisms.
- Governments in the region have included ecosystem protection in their Nationally Determined Contributions and formalised reef response governance frameworks led by Reef Response Committees. Introducing **insurance complemented the existing broader ecosystem resilience** initiatives, such as the Reef Rescue Initiative .
- Signing of **formal agreements** as part of this project by all four MAR countries confirms official recognition of insurance as an effective tool for the disaster risk management of a natural ecosystem.

PREMIUM SUPPORT

- While long-term premium subsidy is justified for the protection of public goods like coral reefs, **current national frameworks in the MAR countries lack mechanisms** for sustained 100% premium support as an alternative to post-disaster aid.
- **To ensure long-term premium financing, an endowment fund** has been developed, which is intended to generate investment returns that can fund premiums. This offers a clear target for sustainable premium financing.
- While initial interviews and assessments provide insight into the ability and willingness of beneficiaries of the reef insurance to contribute to premiums, **securing the financial sustainability of the solution** demands a clearer premium financing strategy. A dedicated fundraising campaign is essential to secure sustainable funding for annual premium payments in the long-term.
- **Integrating premium support into a wider risk management strategy** helps reinforce resilience, especially when combined with capacity-building for local reef response groups.

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OUTLOOK

ISF is currently providing premium funding in the form of a EUR 400,000 grant to support MAR Fund's acquisition of two seasons of hurricane insurance for the MAR. The funding has been structured with a decreasing share over time, in order to build on the initial outcomes of the project while gradually strengthening MAR Fund's own capacity to sustain coverage.

In parallel, MAR Fund has developed an endowment fund. The investment strategy, investment committee, and operational structure can leverage MAR Fund's existing administrative and financial infrastructure, and an endowment account could become fully functional with sufficient seed capital. This mechanism is intended to ensure long-term financial sustainability and to provide a stable foundation for expanding climate risk insurance solutions in the region.

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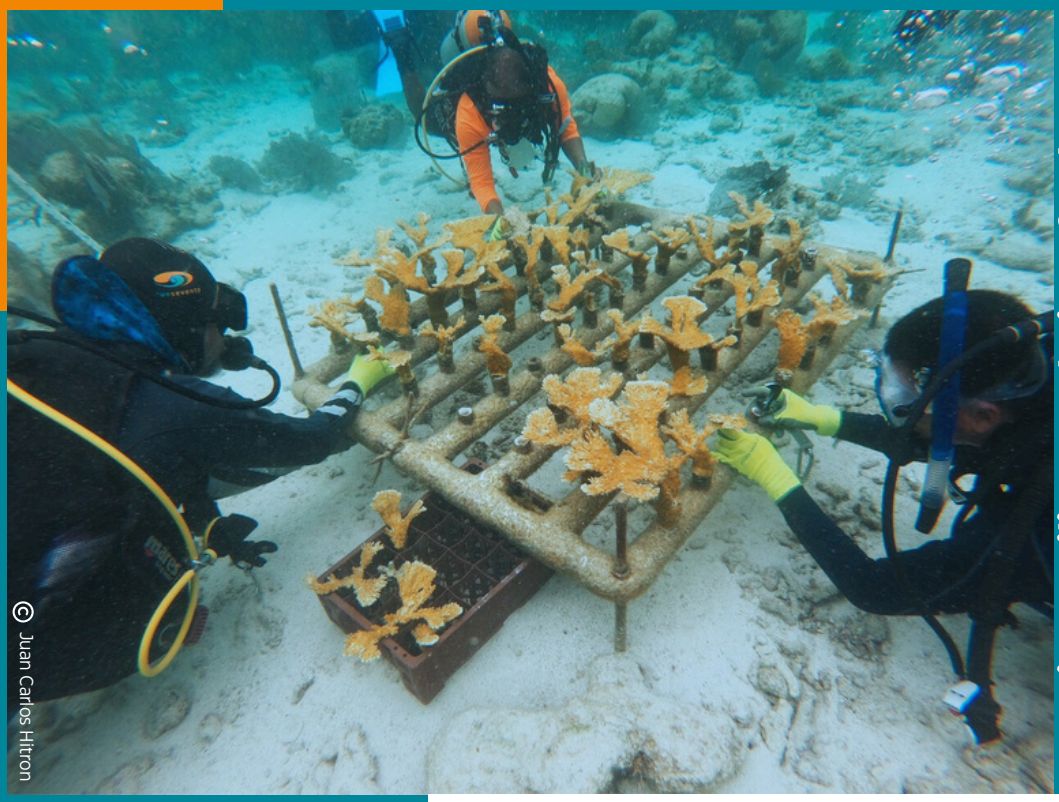

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