Risk financing solutions and transfer mechanisms to promote climate resilience for ecosystems

Inception workshop for Siargao, Philippines

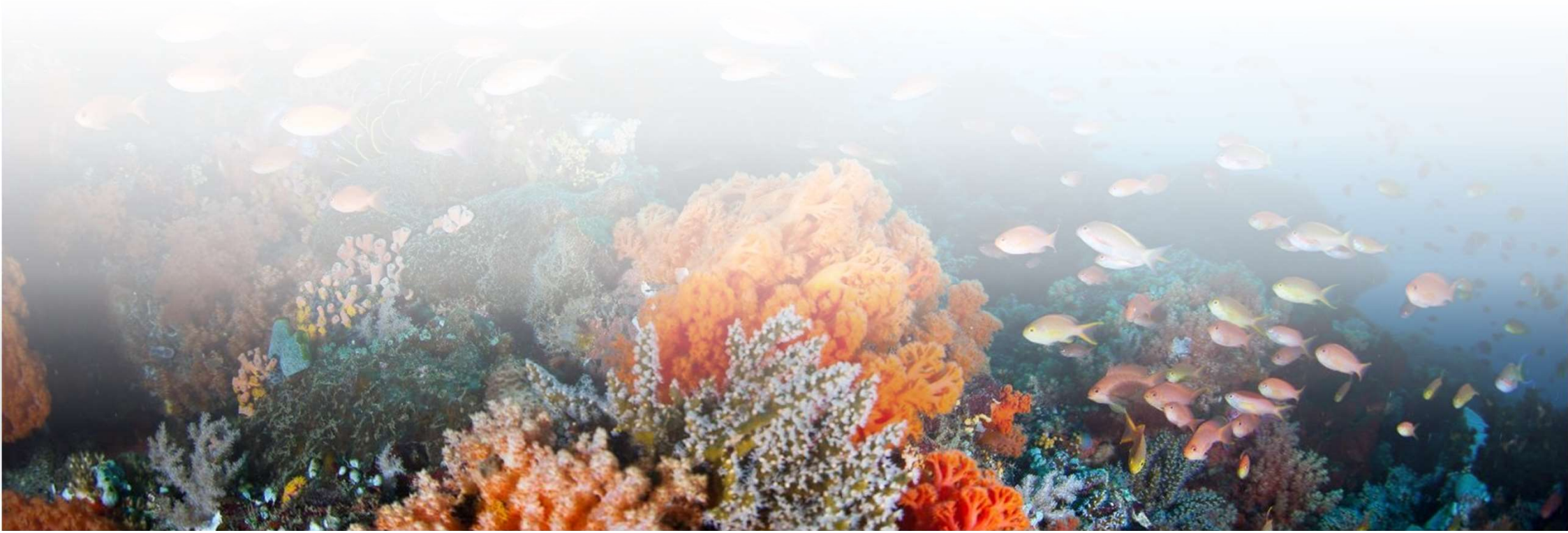
Output 4 under TA-6742 REG: Building Coastal Resilience through Nature-Based and Integrated Solutions

Location: General Luna, Siargao, Philippines

Date: 22 May 2024

Project Purpose

Identify and make recommendations for the applicability of sustainable financing and risk management models and approaches for coral reef ecosystems in targeted, high-opportunity sites in four countries, namely Fiji, Indonesia, the Philippines and Solomon Islands, towards increasing the climate resilience of coastal businesses, communities and their livelihoods.



Project Objectives

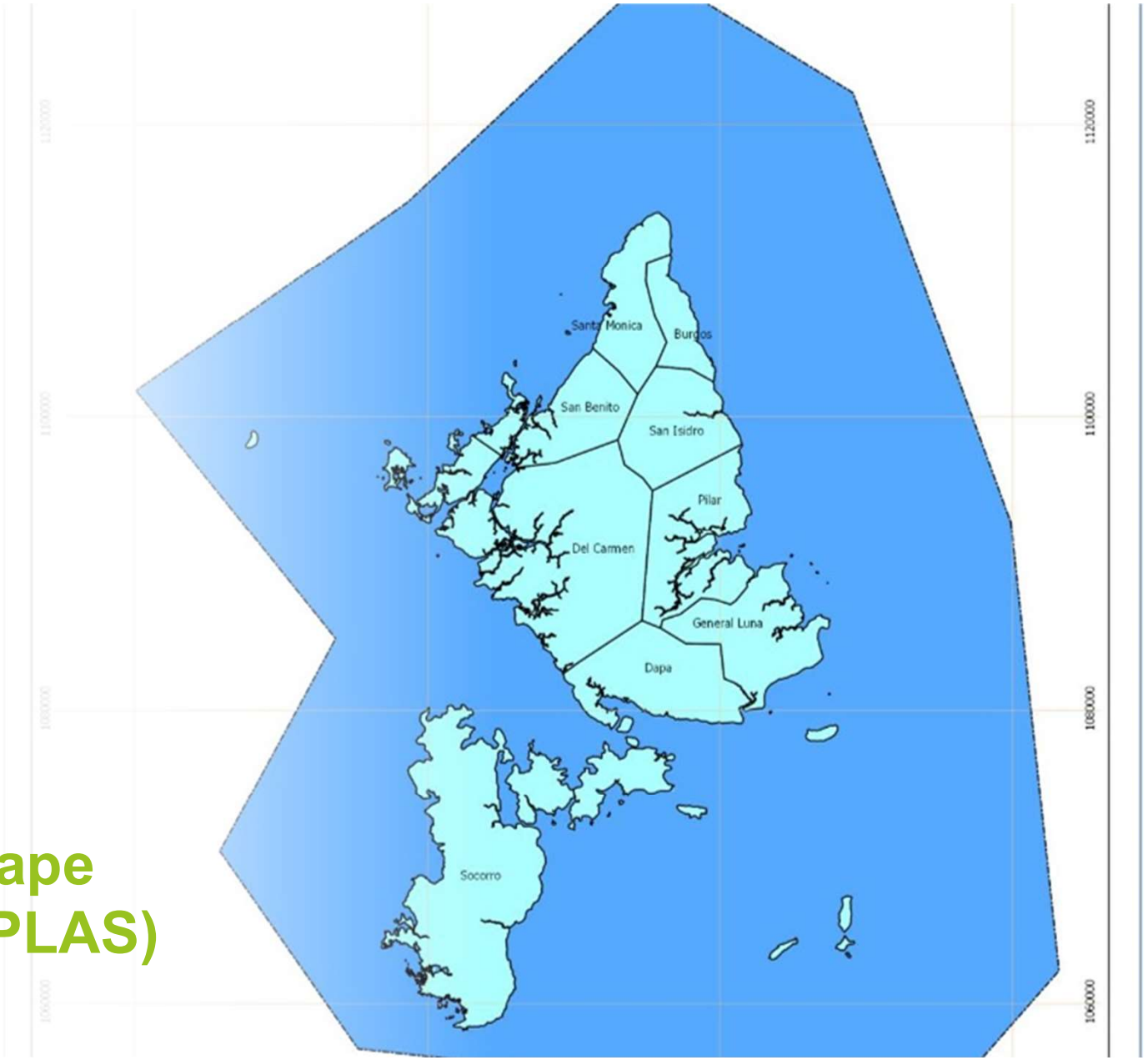
- **Building the case for effective coral reef protection, restoration and sustainable management** by defining the range of goods and services they provide and quantifying the environmental, social and economic risks associated with their damage;
- **Implementing strong policies and governance approaches** to underpin their protection, restoration and sustainable management; and
- **Assessing viable options for sustainable financing and risk management** models and approaches, to optimize and complement the limited public funds allocated for coral reef protection and restoration.

Consulting team

Lead consultant: Landell Mills Limited in association with Swiss Re Group

Local partner: Rare

Siargao Islands Protected Landscape and Seascape (SIPLAS)



Timeline

PAST

September to November 2023

Development of **methodology** and **Inception report**

PAST

November 2023

Virtual kick-off meeting with regional stakeholders from the four countries

PAST

January 2024

SIPLAS confirmed as geographical focus in Philippines

PAST

January to April 2024

Initial **Climate Risk Assessment**

PAST

March/April 2024

Initial analysis to identify **pilot location** in **SIPLAS**

TODAY

Presentation of selected pilot site in SIPLAS

NEXT

May to August 2024

Further investigations in the pilot location - Ecosystem valuations, reef vulnerability assessment, cost benefit analysis

NEXT

September/October 2024

Provide **recommendations on** risk financing solutions and transfer mechanisms for the pilot site

NEXT

October to December 2024

Design the risk transfer mechanism for the pilot site

Objectives of this workshop

Understand stakeholder priorities

Gather insights for detail assessment in selected location in Siargao

Desktop Climate Risk Assessment

Climate Risk Assessment – Approach and methodology

Perils in scope

For current hazards, we considered the following hazards.

- Fluvial (river) flood
- Pluvial (rainfall) flood
- Storm surge (coastal flood)
- Wind storm

For future hazards, we considered the climate components and their changes (details on the right).

- The projections were made to the year **2040**, under the **RCP8.5 scenario**. Scenarios parameters can be adjusted if needed

Approach

- Desk-based assessment using Swiss Re's proprietary CatNat® and global datasets
- Conducted to a resolution of 20x20km (may be more granular for some perils).
- Current state based on historic details of perils in scope
- Potential exposures of those same perils based on a projection under SSP5-8,5 scenario for the year 2040.

Section	Climate component
Temperature	Current mean daily temperature (°C)
	Current days above 30 degrees
	Current days above 35 degrees
	Change in mean temperature (°C)
	95th percentile temperature change (°C)
	99th percentile temperature change (°C)
Heat wave	Current heatwave duration
	Current Heatwave frequency
	95th percentile change in heat wave frequency
	99th percentile change in heat wave frequency
Rainfall	Max monthly precipitation (mm)
	Extreme precipitation (mm)
	Change in extreme precipitation frequency (%)
Windspeed	Mean extreme windspeed today (m/s)
	Change in extreme wind (m/s)

"Extreme" defined as 90th percentile
Temperature values are of air at 2m above the surface

Philippines: Siargao current hazard analysis

Current hazard overview

The main hazard across Philippines is **Windstorm**, given the position of Siargao it is less exposed than other parts of the country. However, the island still faces a high windstorm risk rating.

For other hazards, sites which are closer to river bodies have higher relative flooding associated risk.

Hazard	General Luna	Del Carmen	San Benito	Santa Monica	Burgos	San Isidro	Pilar	Dapa	Socorro
Pluvial Flood	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Low	Very Low	Very Low
River Flood	Very Low	Medium	Very Low	Very Low	Very Low	Medium	Very Low	Very Low	Very Low
Storm Surge	High	High	Medium	Medium	Medium	Medium	High	Medium	High
Wind Storm	High	High	High	High	High	High	High	High	High

**Note - This assessment presents a streamlined qualitative perspective, summarising return periods and likelihood of occurrences across various inputs, measurement methods, and hazards.*
It includes assumptions that data from onshore sources aligns with offshore effects. The findings are converted into a numerical rating, aiding in the 'Initial Prioritization' process to inform preliminary site selection recommendations.

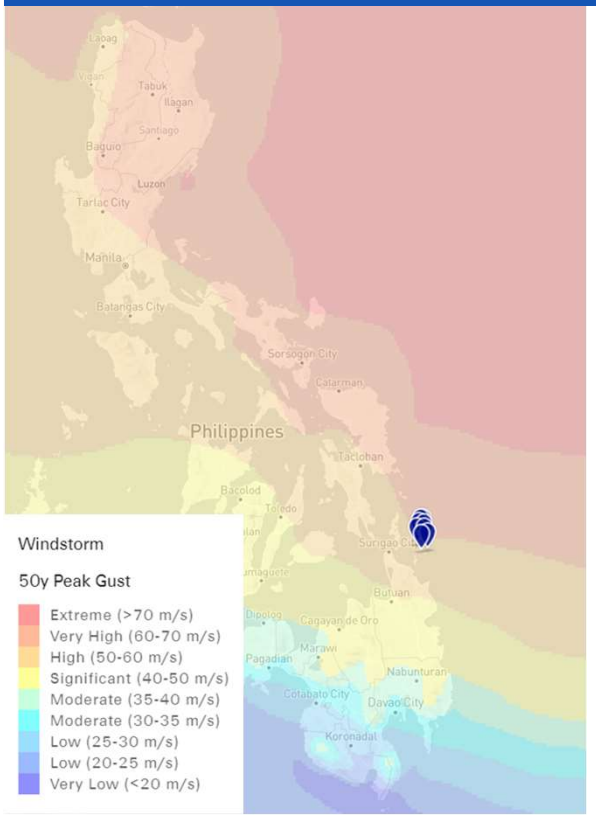
Windstorm risk across Siargao

Current hazard overview

As mentioned previously, the northern part of the Philippines is most susceptible to windstorms

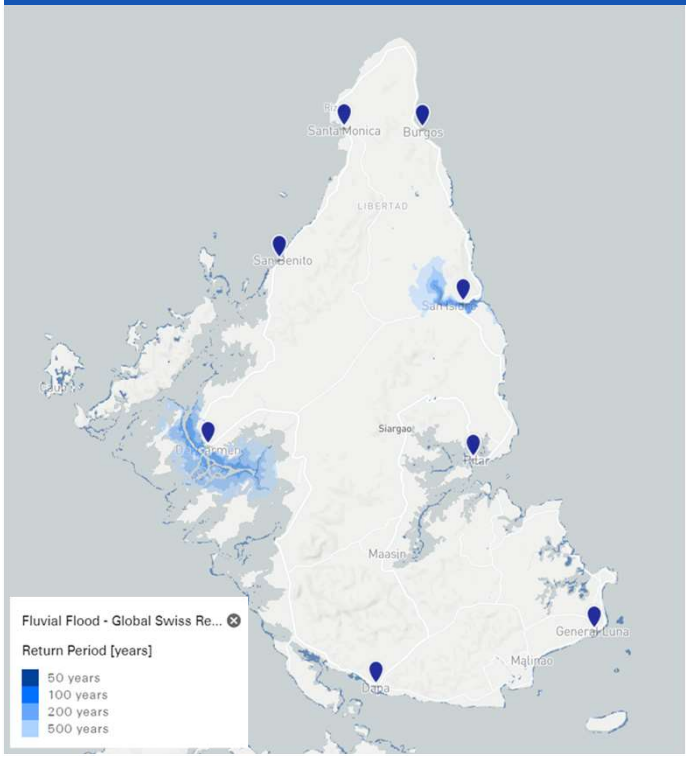
Given the position of Siargao, while it is not in the highest risk category, it is still considered a high risk for windstorm activity.

Philippines overview and Siargao zoom in

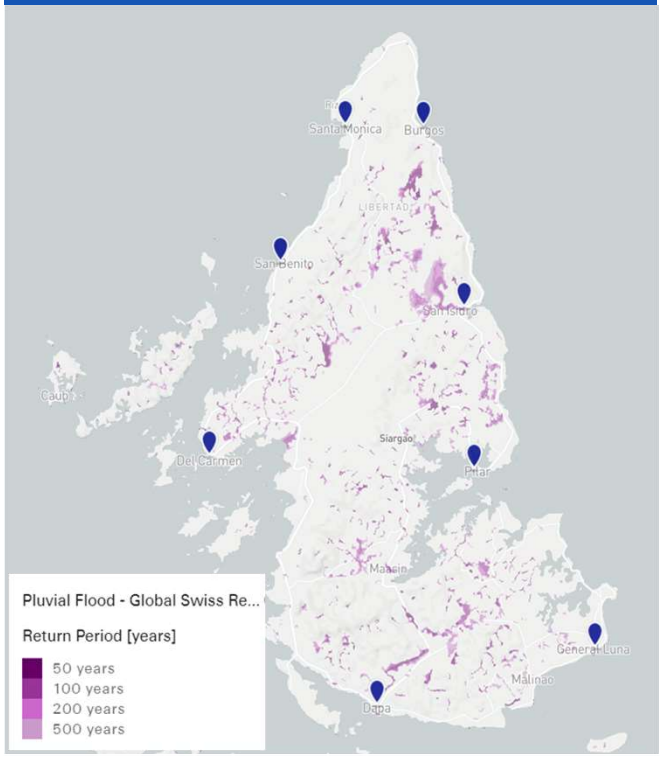


Flooding risk across Siargao

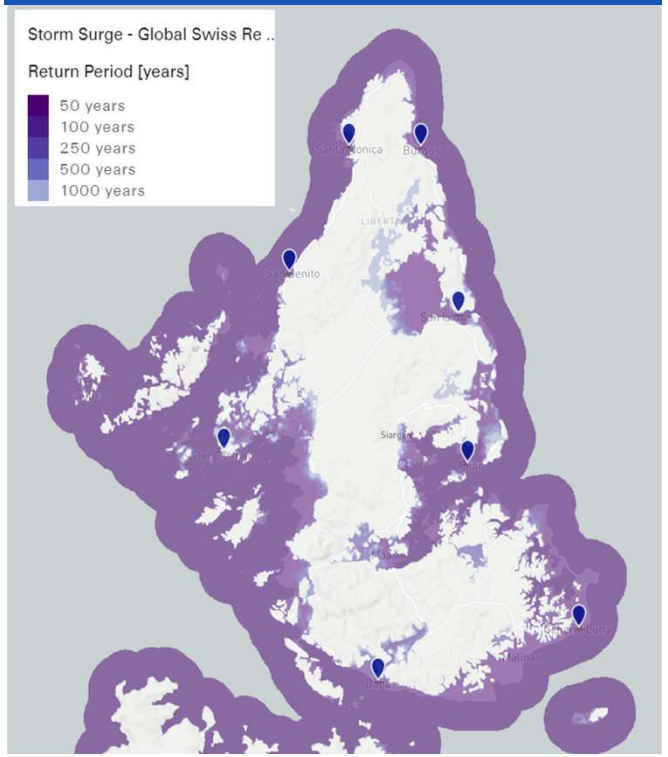
Fluvial (river) flooding



Pluvial flooding

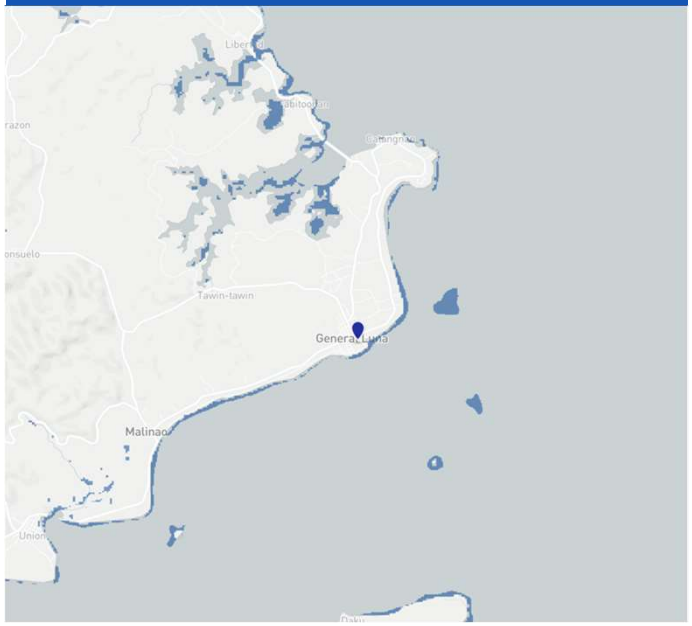


Storm Surge



General Luna

Fluvial (river) flooding



Fluvial Flood - Global Swiss Re...

Return Period [years]

- 50 years
- 100 years
- 200 years
- 500 years

Pluvial flooding

Pluvial Flood - Global Swiss Re...

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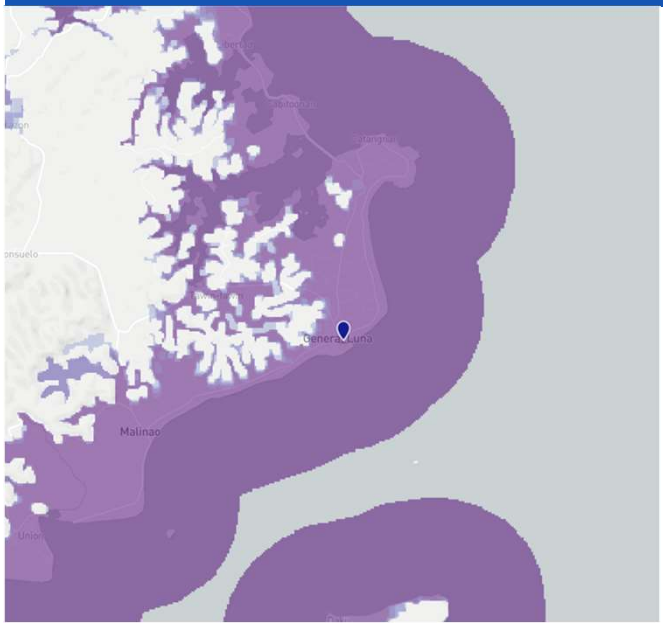
Storm Surge



Storm Surge - Global Swiss Re ..

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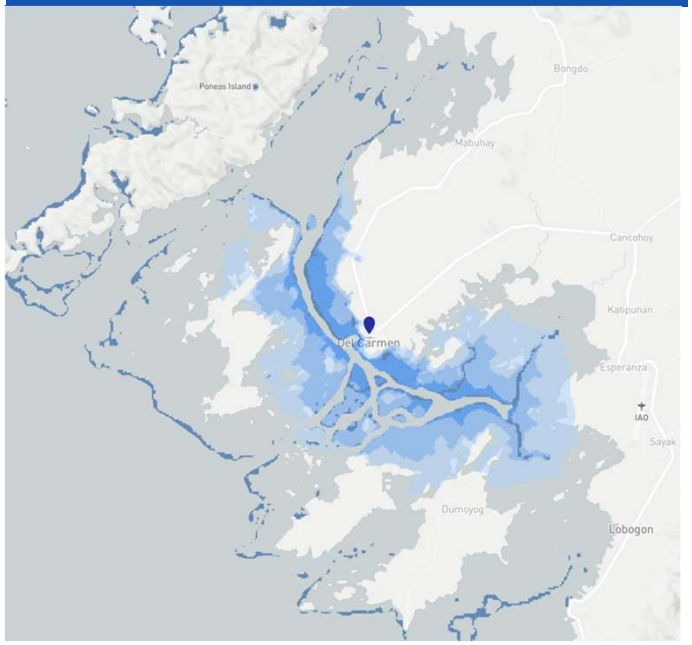
Del Carmen

Fluvial (river) flooding



Fluvial Flood - Global Swiss Re...

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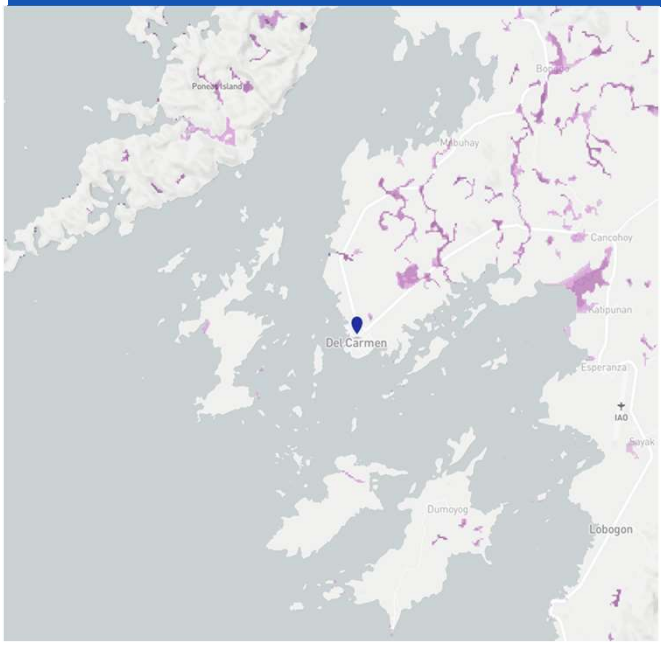
Pluvial flooding



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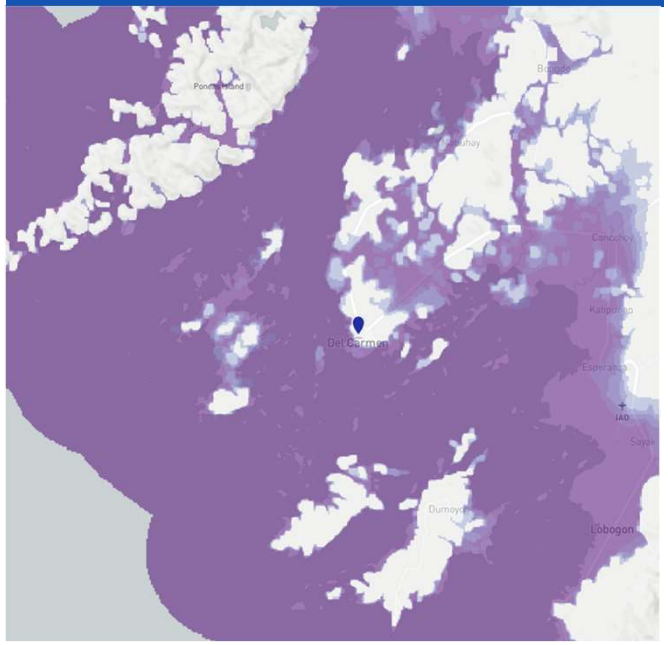
Storm Surge



Storm Surge - Global Swiss Re ..

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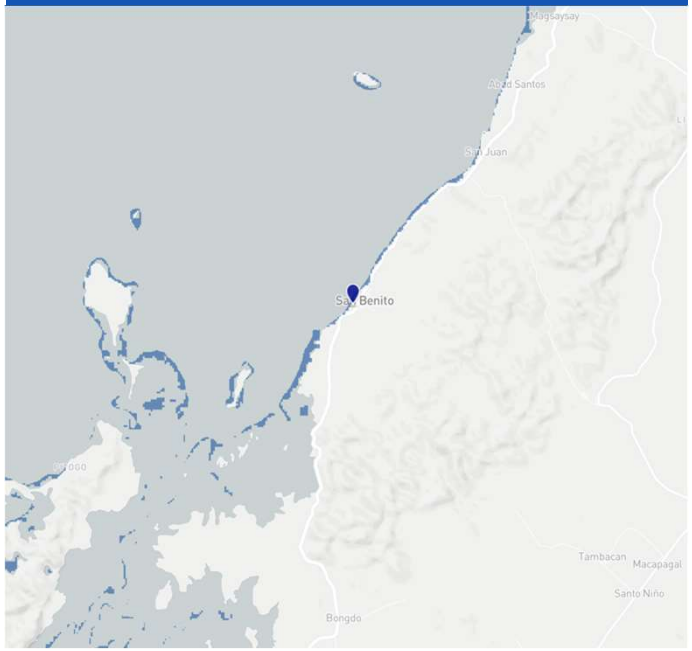
San Benito

Fluvial (river) flooding



Fluvial Flood - Global Swiss Re...

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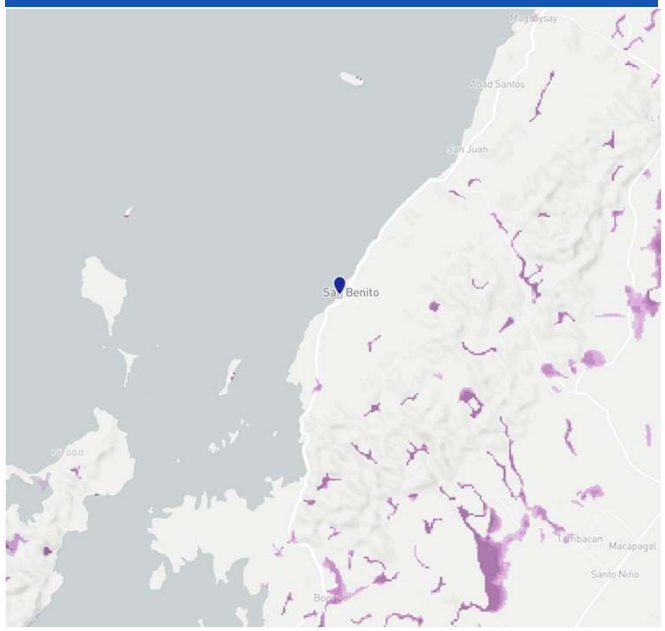
Pluvial flooding



Pluvial Flood - Global Swiss Re...

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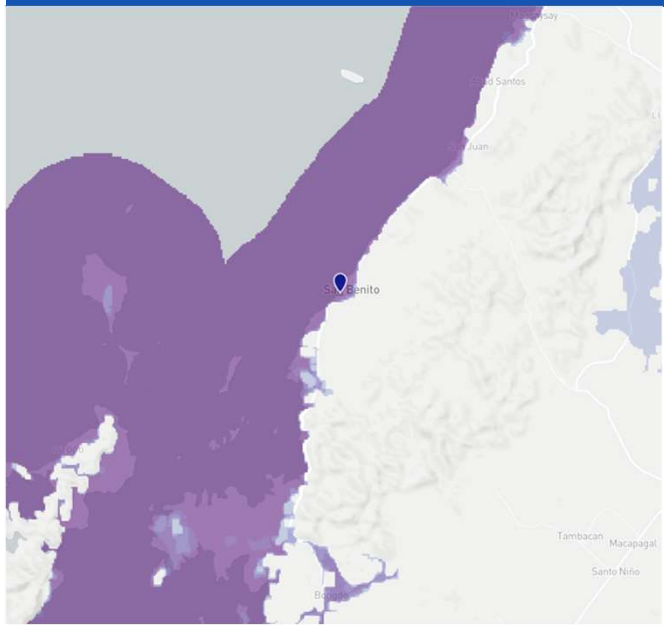
Storm Surge



Storm Surge - Global Swiss Re ..

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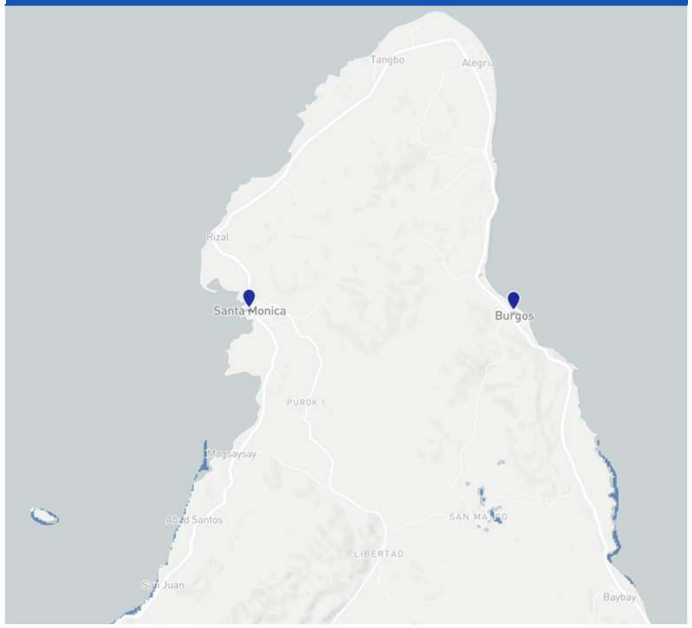
Santa Monica and Burgos

Fluvial (river) flooding



Fluvial Flood - Global Swiss Re...

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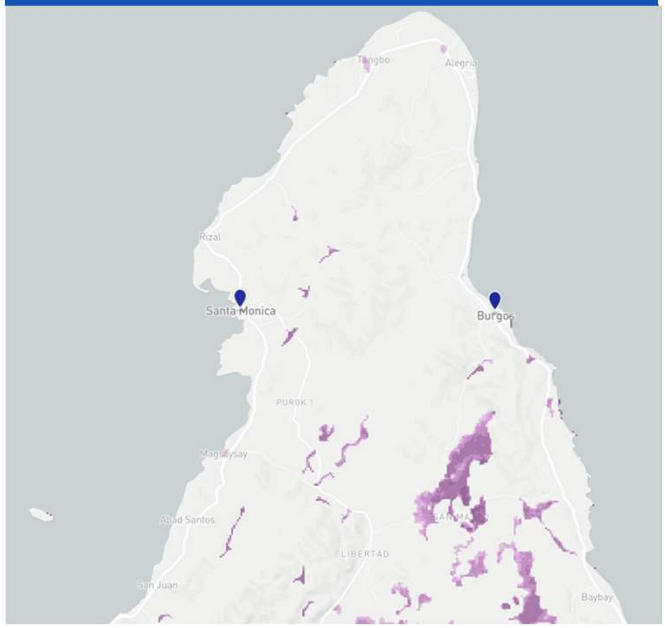
Pluvial flooding



Pluvial Flood - Global Swiss Re...

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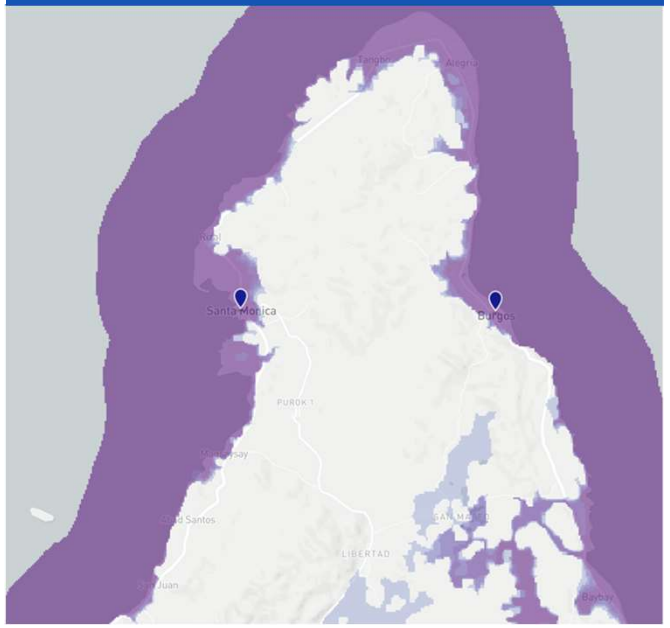
Storm Surge



Storm Surge - Global Swiss Re ..

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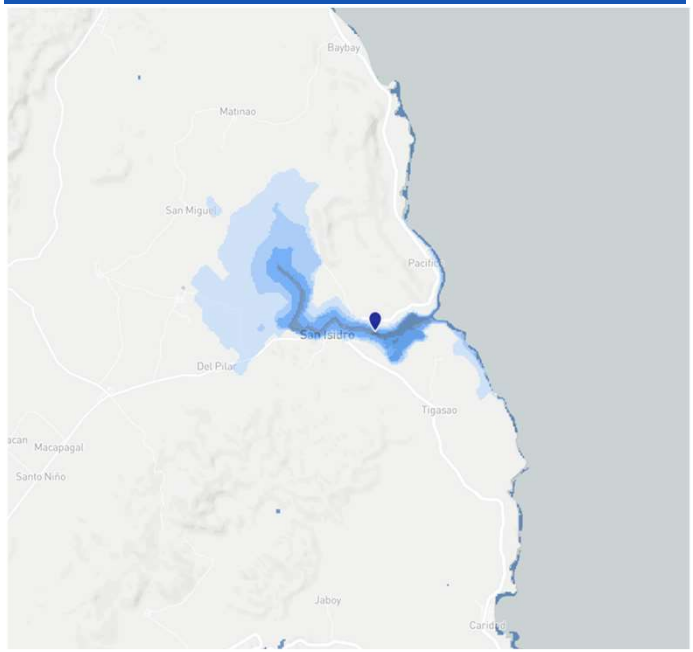
San Isidro

Fluvial (river) flooding



Fluvial Flood - Global Swiss Re...

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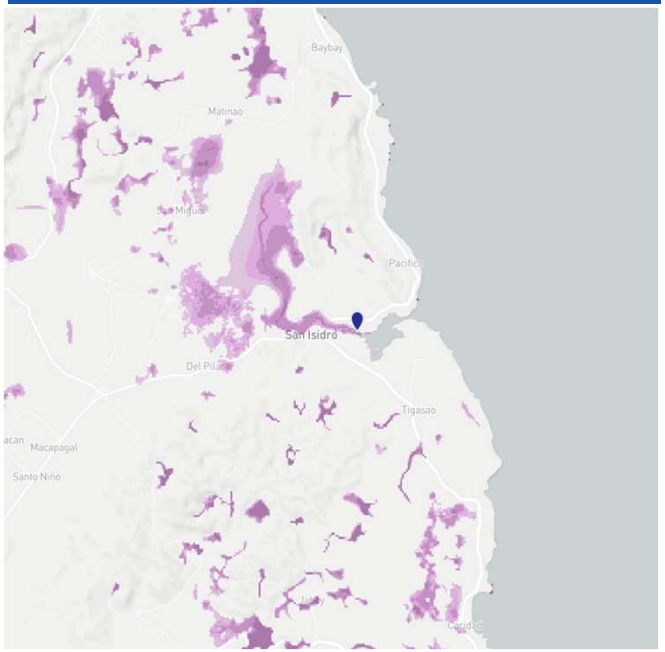
Pluvial flooding



Pluvial Flood - Global Swiss Re...

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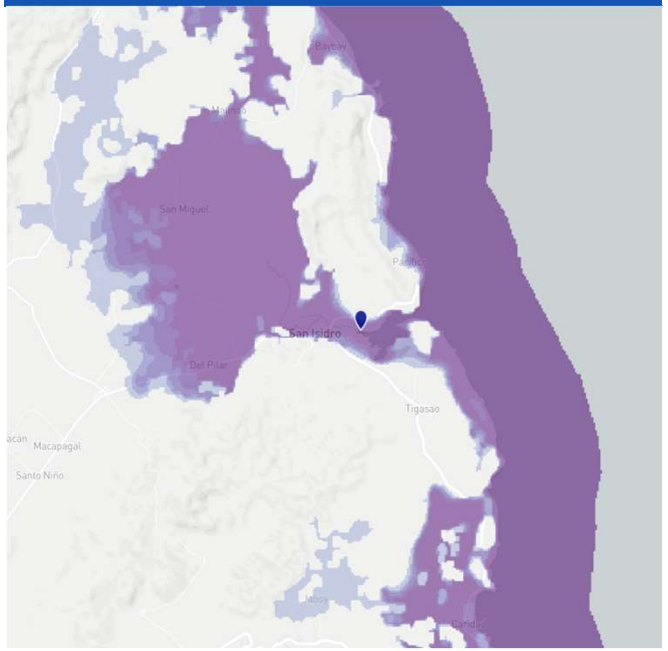
Storm Surge



Storm Surge - Global Swiss Re ..

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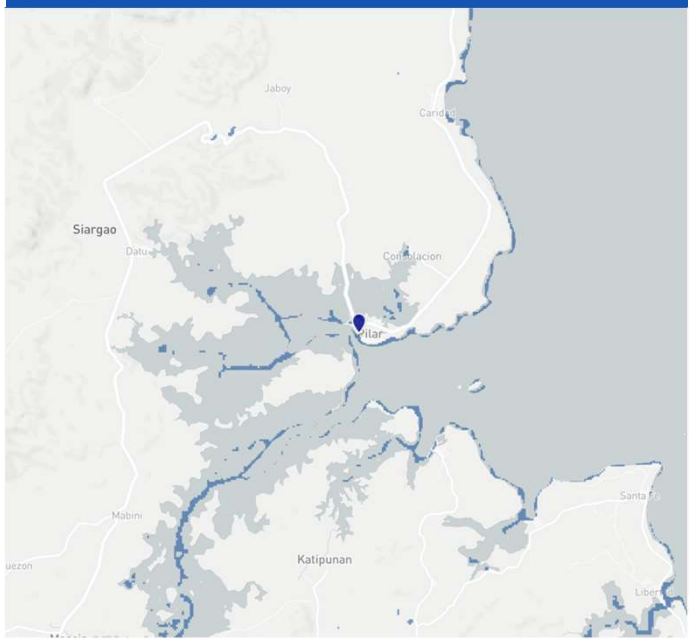
Pilar

Fluvial (river) flooding



Fluvial Flood - Global Swiss Re...

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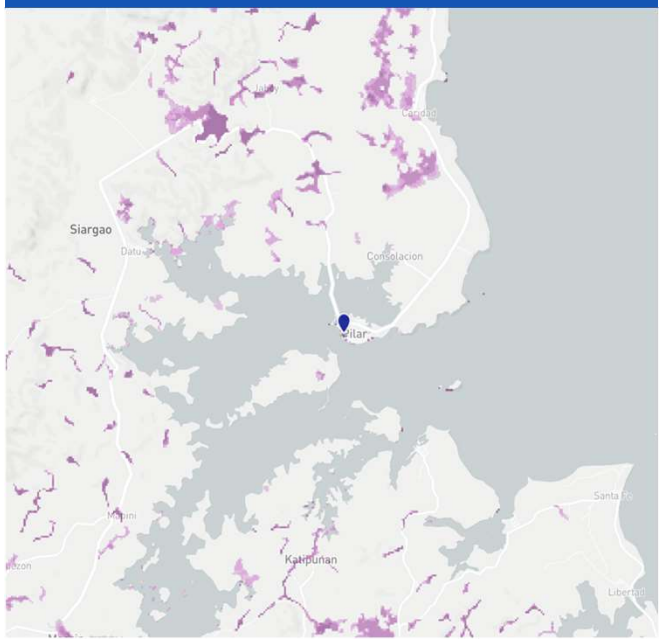
Pluvial flooding



Pluvial Flood - Global Swiss Re...

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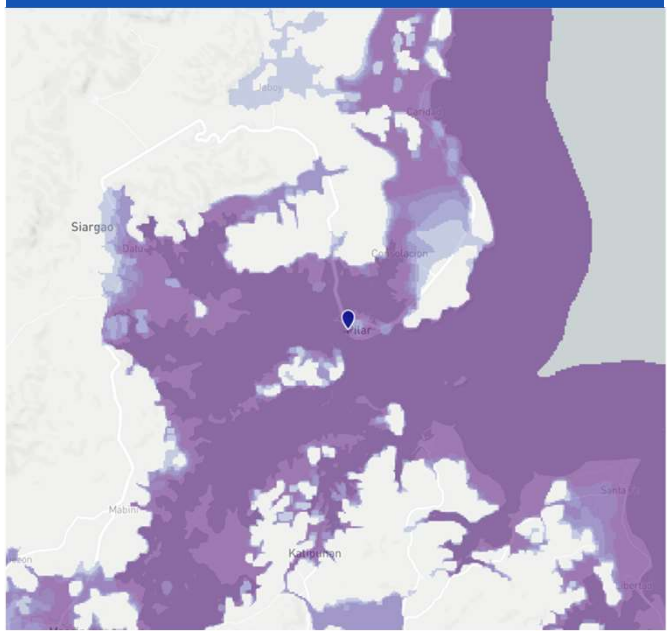
Storm Surge



Storm Surge - Global Swiss Re ..

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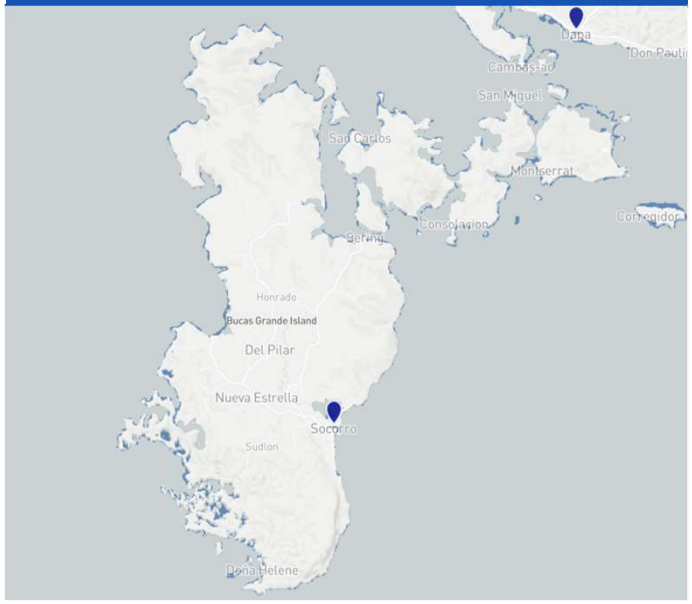
Socorro

Fluvial (river) flooding



Fluvial Flood - Global Swiss Re...

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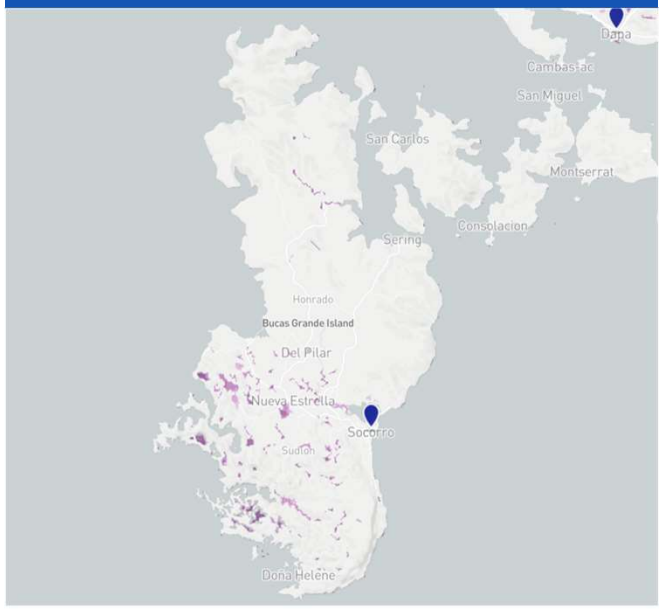
Pluvial flooding



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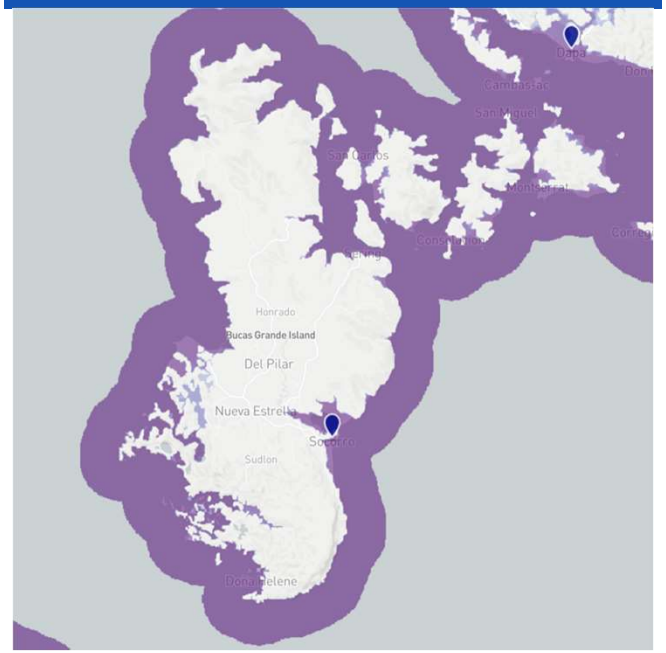
Storm Surge



Storm Surge - Global Swiss Re ..

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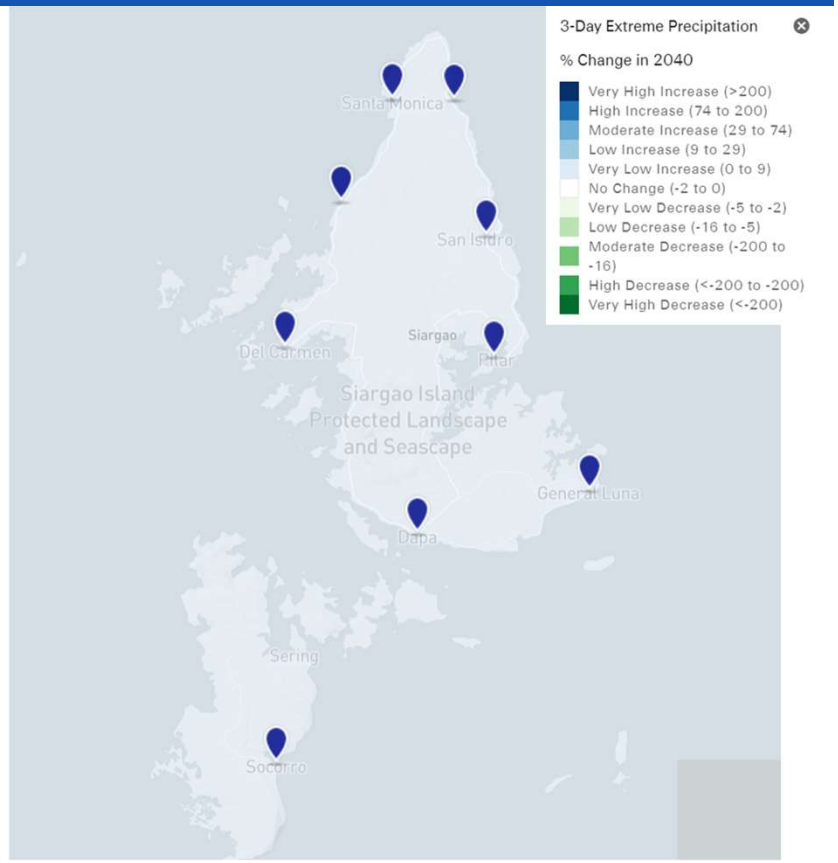
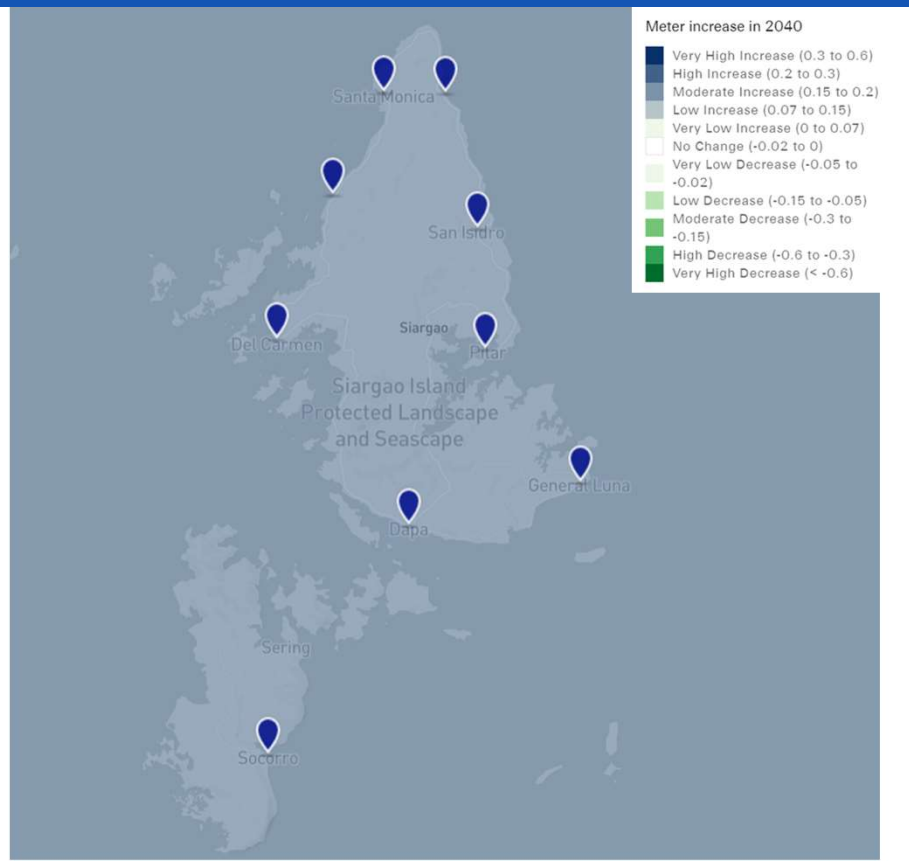
Siargao: Future climate risk analysis

Extreme rainfall and sea level risk is consistent across the island.

Extreme Precipitation



Sea Level Rise

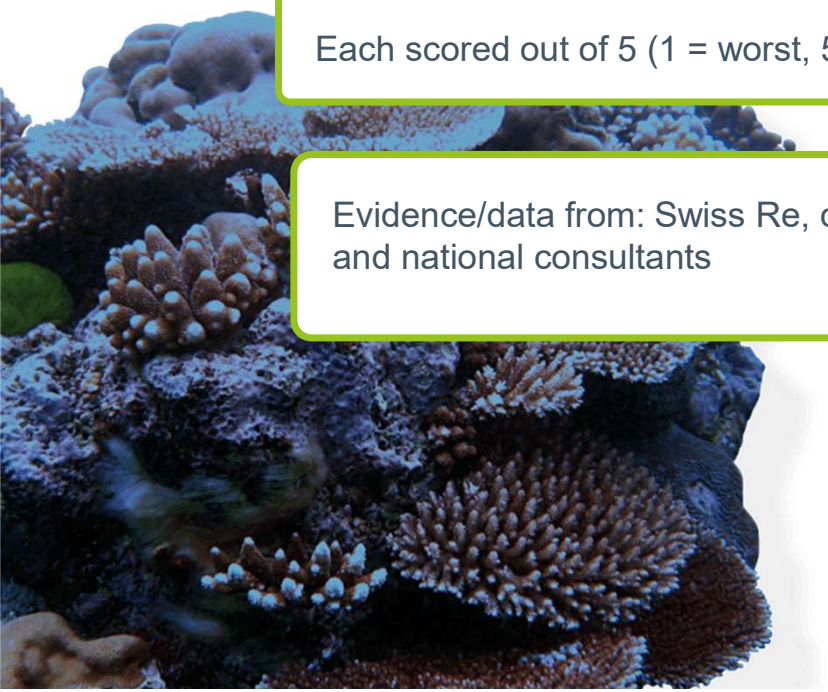


Identification of pilot location in SIPLAS

Prioritization approach

- Aim to identify the pilot location within Siargao Island – with LGUs used as locations.
- Transparent and scientific evidence-based approach to help inform decision making
- Four categories evaluated: Risks, Corals, Socio-economic values and Governance

12 criteria scored and 'weighted'



Each scored out of 5 (1 = worst, 5 = best)

Weightings vary between 5 and 15 per criteria

Evidence/data from: Swiss Re, databases, and national consultants

Based on consulting team judgement

Total weighting 100

TODAY

Presentation of results to stakeholders

SUSTAIN VALUE

Prioritization criteria

Risks			Corals			Socio-economics					Governance
Current flooding	**Current wind**	**Human disturbances**	**Extent of corals**	**Bio-diversity value**	**Condition of coral**	**Coastal protection value**	**Local popul-ation in area**	**General tourism value**	**Diving/ snorkelling value**	**Fisheries value**	**Organisations set up to implement it**
Hazard from flooding (storm surges, fluvial & pluvial)	Hazard from wind and cyclones	Threats from: fishing, coastal development, on-shore & marine pollution - Plus maritime traffic.	Size of coral area	Diversity of fish species	% hard coral cover	Relative value of shoreline protection provided by corals	Number of people living in the area - cities and coastal communities	Extent of hotels & restaurants - and overall value of tourism	Importance (extent) of diving and snorkelling in the vicinity	Importance of commercial and subsistence fisheries in the vicinity	Extent to which organisations at the site may be interested in supporting its implementation
Swiss Re		**Databases**	**Databases + national consultants**								**National consultants**

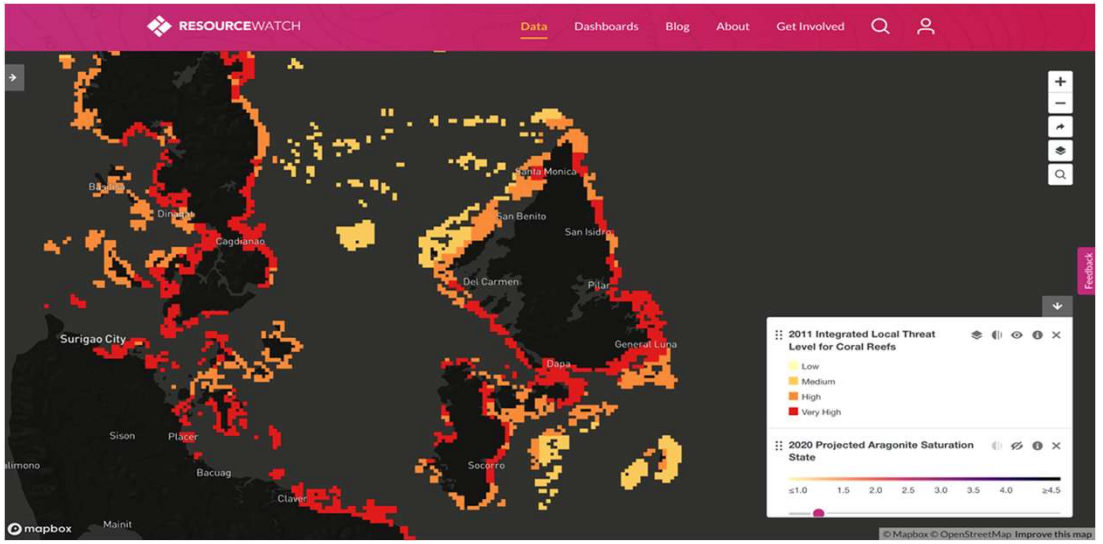
Weightings:

5	5	10	5	5	10	10	5	10	10	15	10

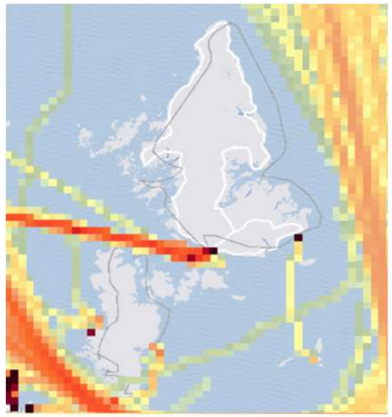
Human Disturbances - results

Sites	Local Threats	Global Maritime Traffic	Average Score
1) General Luna	5	2	3.5
2) Dapa	5	5	5
3) Pilar	5	1	3
4) San Isidro	4	1	2.5
5) Burgos	4	1	2.5
6) Sta. Monica	3	3	3
7) San Benito	3	1	2
8) Del Carmen	3	3	3
9) Socorro	4	4	4

Scores based on average of ResourceWatch 'Local threats' and Global Maritime Traffic Density Service (GMTDS)



Local threats - ResourceWatch



Maritime traffic

Swiss Re

Extent of corals - results

Site	*Coral Reef Area (km2)	Score
1) General Luna	45.1	5
2) Dapa	11.7	2
3) Pilar	5.2	1
4) San Isidro	2.2	1
5) Burgos	4	1
6) Sta. Monica	16.9	2
7) San Benito	28	3
8) Del Carmen	45.8	5
9) Socorro	35.3	4

Relative scores, calculated by working out the range (max – min) and then assigning the sites into 5 intervals (range/5).

*Area is estimated from Allen Coral Reef Atlas shapefiles

Biodiversity value (fish diversity) - results

Biodiversity value information was provided by national consultants based on local knowledge and literature.

Relative score out of 5 given for each site.

Site	Biodiversity Value Information – Average fish species richness in 2022	Score
1) General Luna	108 compared to 127 pre-Odette	4
2) Dapa	132 compared to 142 pre- Odette	5
3) Pilar	68 compared to 104 pre-Odette	2
4) San Isidro	No data*	2.5
5) Burgos	56 compared to 106 pre-Odette	1
6) Sta. Monica	77 compared to 100 pre-Odette	3
7) San Benito	64 compared to 78 pre-Odette	2
8) Del Carmen	86 compared to 114 pre-Odette	3
9) Socorro	110 compared to 114 pre-Odette	4

*No data – so we assume an average of 2.5
Data provided by RARE Philippines

Coral condition - results

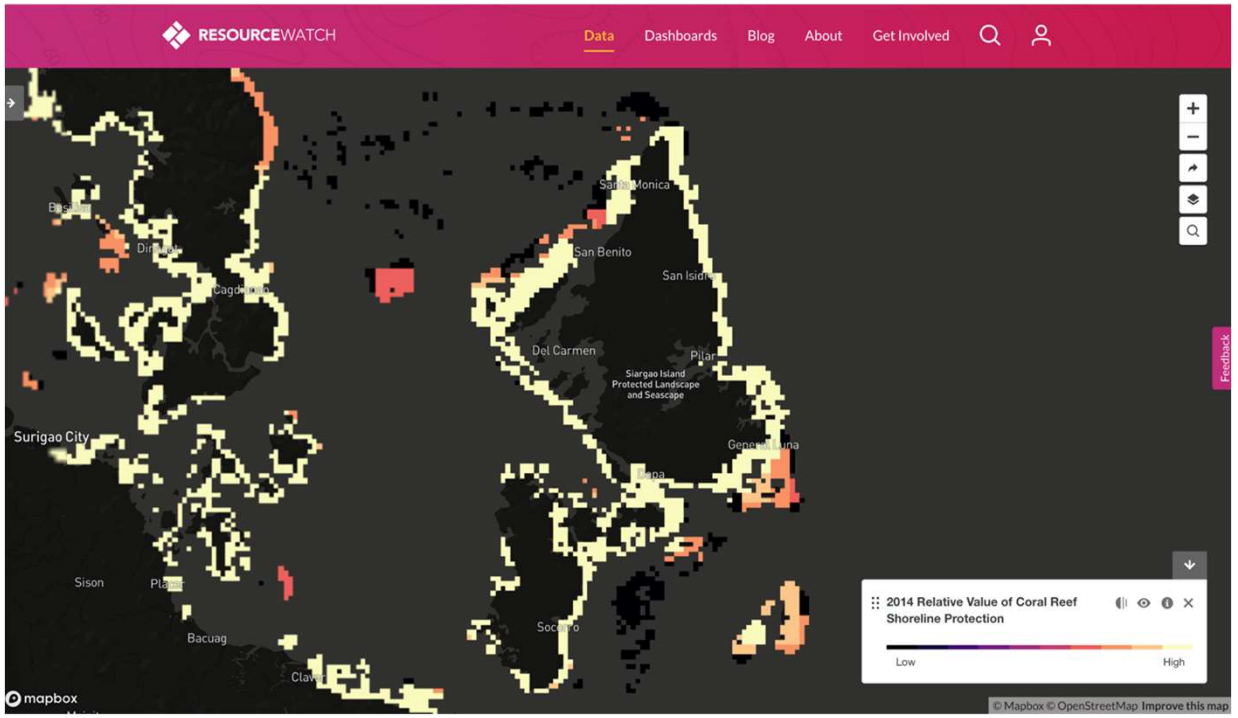
- Coral reef area is estimated from 2018 Allen Coral Reef Atlas shapefiles
- % **hard coral cover data** is from the Protected Area Management Office – based on areas mapped (not the entire extent of reef) per municipality – hence may not be fully representative. The area may also include some areas with algae.
- * Data is from 2018, before the supertyphoon in 2021 and possible bleaching events between 2018 and 2024
- Note: For Dapa and Socorro only the reefs directly off the coast were counted. Reef areas on surrounding islands were not.

Site	*Coral Reef Area (km2)	*% Hard coral cover	Score
1) General Luna	45.1	30.46%	4
2) Dapa	11.7	39.90%	5
3) Pilar	5.2	29.54%	4
4) San Isidro	2.2	8.80%	1
5) Burgos	4	25.11%	3
6) Sta. Monica	16.9	43.13%	5
7) San Benito	28	32.53%	4
8) Del Carmen	45.8	17.02%	2
9) Socorro	35.3	35.51%	4

Scoring approach: Baseline score: 5 fixed intervals of 20% increments.

Coastal Protection Value - results

Site	Score
1) General Luna	5.0
2) Dapa	3.0
3) Pilar	5.0
4) San Isidro	5.0
5) Burgos	5.0
6) Sta. Monica	3.0
7) San Benito	3.0
8) Del Carmen	3.0
9) Socorro	5.0



WRI ResourceWatch
Scores also adjust down by one for those LGUs facing the west, as less fetch.

Local population in area - results

Sites	Population (as of May 2020)	Score
1) General Luna	22,853	4
2) Dapa	29,006	5
3) Pilar	10,374	2
4) San Isidro	8,519	1
5) Burgos	4,185	1
6) Sta. Monica	9,423	2
7) San Benito	5,663	1
8) Del Carmen	20,127	4
9) Socorro	25,942	5

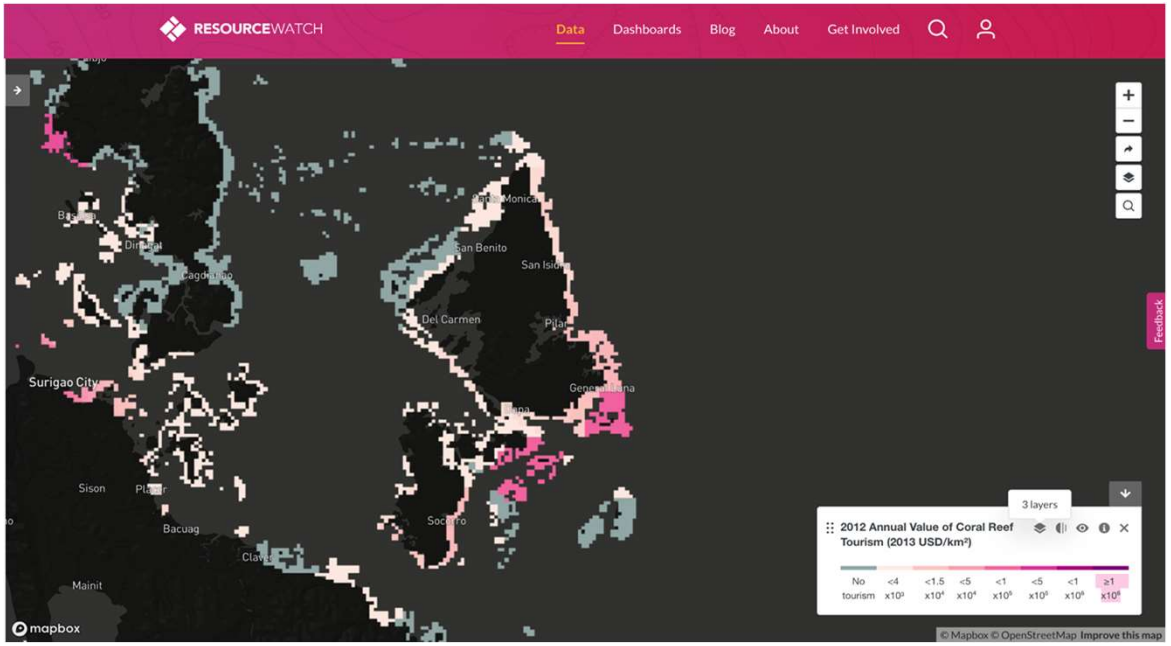
Relative scores calculated by working out the range (max – min) and then assigning the sites into 5 intervals (range/5).

Data obtained from Philippine Statistics Authority as of May 1, 2020

Tourism Value - results

Sites	ResourceWatch Score	Tourism Establishments	Average Score
1) General Luna	4	5	4.5
2) Dapa	4	2	3
3) Pilar	2.5	3	2.75
4) San Isidro	2	3	2.5
5) Burgos	3	1	2
6) Sta. Monica	2	3	2.5
7) San Benito	1.5	1	1.25
8) Del Carmen	2	2	2
9) Socorro	3	2	2.5

Data from ResoureWatch and from national consultants on tourism establishments



WRI ResourceWatch

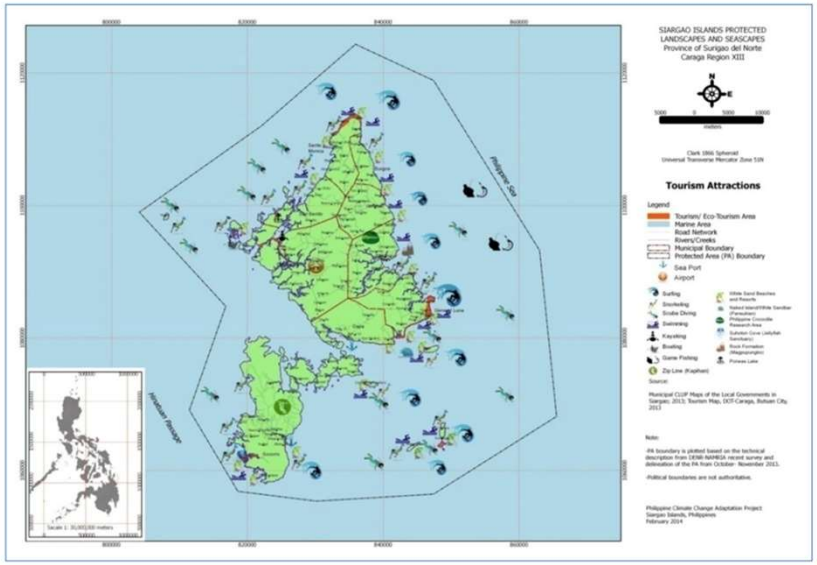
Diving/snorkelling value - results

Sites	Dive.Site Score	DOT Caraga (2010)	Average Score
1) General Luna	3	5	4
2) Dapa	2	1	1.5
3) Pilar	2	2	2
4) San Isidro	1	1	1
5) Burgos	1	2	1.5
6) Sta. Monica	1	2	1.5
7) San Benito	1	3	2
8) Del Carmen	1	3	2
9) Socorro	1	3	2

Scores based on average scores out of 5 from information on Dive.Site website and Caraga (20210)

Dive.Site

Caraga (2010)



Source: Tourism Map, DOT Caraga, Butuan City, 2010

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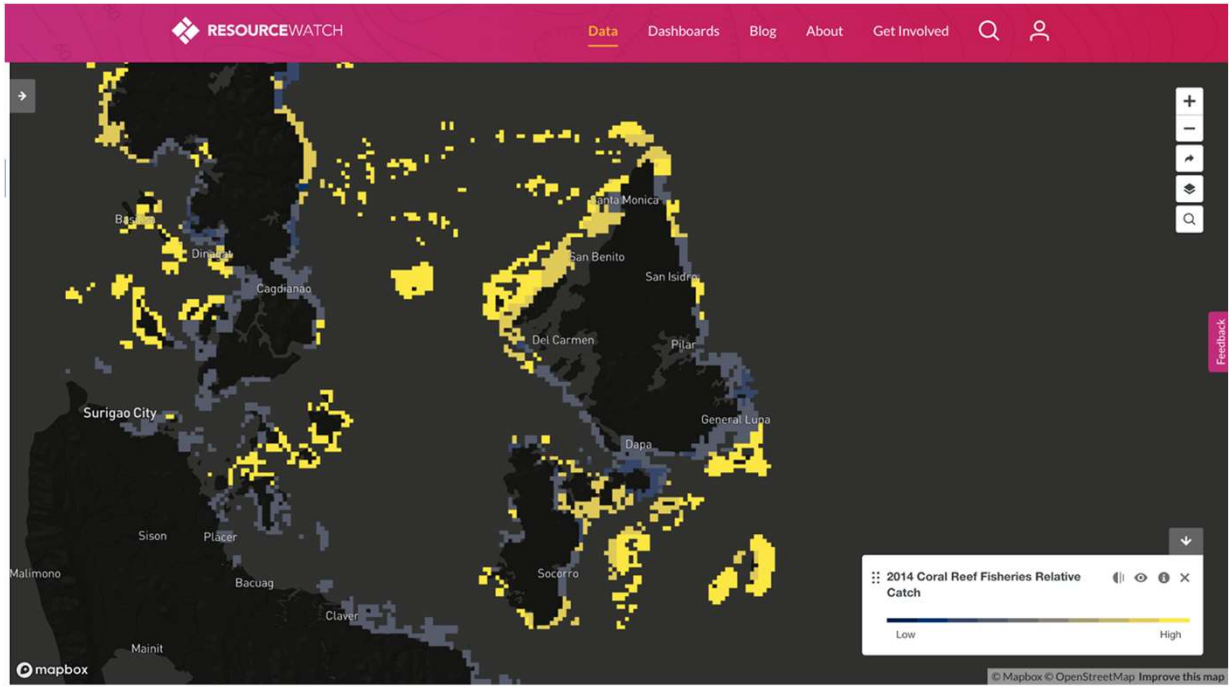
Fisheries value - results

Sites	Score
1) General Luna	4
2) Dapa	3
3) Pilar	1
4) San Isidro	3
5) Burgos	4
6) Sta. Monica	5
7) San Benito	5
8) Del Carmen	5
9) Socorro	4

Data based on ResourceWatch



WRI ResourceWatch

Organisations set up to implement it - results

Information provided by national consultants

Site	Organisations that could potentially help	Score
1) General Luna	PAMB for SIPLAS, PASu, LGU, MPA Management, RARE, STOA, POs; greatest concentration of tourism estalishments	5
2) Dapa	PAMB for SIPLAS, PASu, LGU, MPA Mgt., RARE, STOA, POs	3
3) Pilar	PAMB for SIPLAS, PASu, LGU, MPA Mgt., RARE, STOA, POs	3
4) San Isidro	PAMB for SIPLAS, PASu, LGU, MPA Mgt., RARE, STOA, POs	3
5) Burgos	PAMB for SIPLAS, PASu, LGU, MPA Mgt., RARE, STOA, POs	3
6) Sta. Monica	PAMB for SIPLAS, PASu, LGU, MPA Mgt., RARE, STOA, POs	3
7) San Benito	PAMB for SIPLAS, PASu, LGU, MPA Mgt., RARE, STOA, POs	3
8) Del Carmen	PAMB for SIPLAS, PASu, LGU, MPA Mgt., RARE, STOA, POs; most progressive LGU executive; perceived to be more open to these kind of initiatives	5
9) Socorro	PAMB for SIPLAS, PASu, LGU, MPA Mgt., RARE, STOA, Pos - but poor accesibility	2

STOA is Siargao Tourism Operators Association; PASu is Protected Area Superintendent Office

Weighted scores

Site	Ranking	Weighted total score	Risks			Corals			Socio-economics					Governance
			Current flooding	Current wind	Human disturb-ances	Extent of corals	Bio-diversity value	Condition of coral	Coastal protection value	Local popul-ation in area	Tourism value	Diving/ snorkelling value	Fisheries value	Organ-isations set up to implement
1) General Luna	1	418	20	20	35	25	20	40	50	20	45	40	53	50
2) Dapa	2	360	15	20	50	10	25	50	30	25	30	15	60	30
3) Pilar	4	338	20	20	30	5	10	40	50	10	28	20	75	30
4) San Isidro	8	260	15	20	25	5	13	10	50	5	25	10	53	30
5) Burgos	9	258	15	20	25	5	5	30	50	5	20	15	38	30
6) Sta. Monica	6	310	15	20	30	10	15	50	30	10	25	15	60	30
7) San Benito	7	283	15	20	20	20	10	40	30	5	13	20	60	30
8) Del Carmen	5	330	20	20	30	25	15	20	30	20	20	20	60	50
9) Socorro	2	360	20	20	40	20	20	40	50	25	25	20	60	20
Weighting:			5	5	10	5	10		5	10	10	10	10	

= high criteria scores

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SUSTAIN VALUE

Prioritization results

Candidate site	Ranking	Weighted total score
General Lunar	**1**	**418**
Dapa	**2=**	**360**
Socorro	**2=**	**360**
Pilar	**4**	**338**
Del Carmen	5	330
Sta Monica	6	310
San Benito	7	283
Sta Isidro	8	260
Burgos	9	258

- High across all criteria; Highest value; Highest= corals
- High across all criteria; 2nd Highest Value; Highest= corals
- High across all criteria except Organisations to set it up
- High risks and High values

There could be potential for parametric insurance at any of the sites….

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SUSTAIN VALUE

Next steps – Valuation and CBA

Coral Valuation:

- Tourism - direct (diving and snorkelling expenditure)
- Tourism - indirect (visitor expenditure linked to corals – including surfing)
- Fisheries
- Coast protection
- + non-use/conservation, cultural etc

Approach:

Data from literature and 'key informant' interviews
Possible survey(s)?

Cost Benefit Analysis:

- Evaluate lost value from insurable events (e.g. typhoons and bleaching?)
- Include pre- and post-event activities and 'restoration' **costs**
- Estimate **benefits** from pre- and post-event activities and restoration

= Inform business case for parametric insurance
(or another form of sustainable financing/management)

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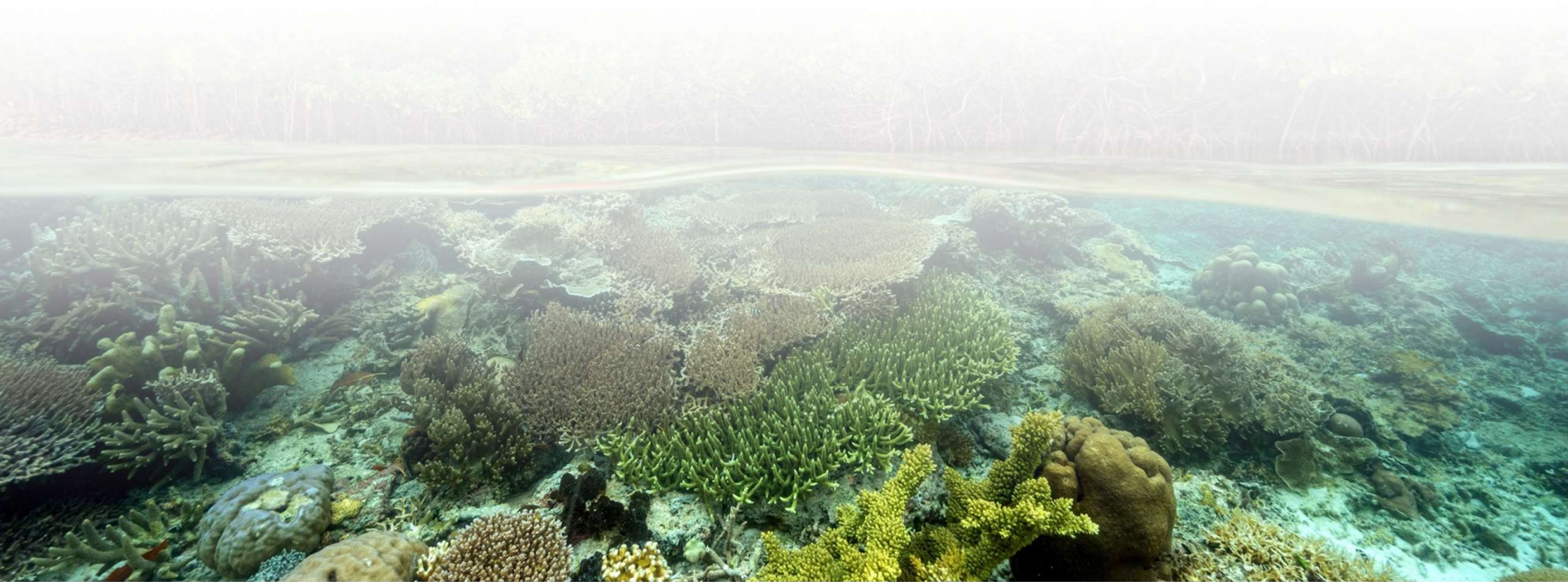
SUSTAIN VALUE

Questions



Reef vulnerability assessment and Restoration plan

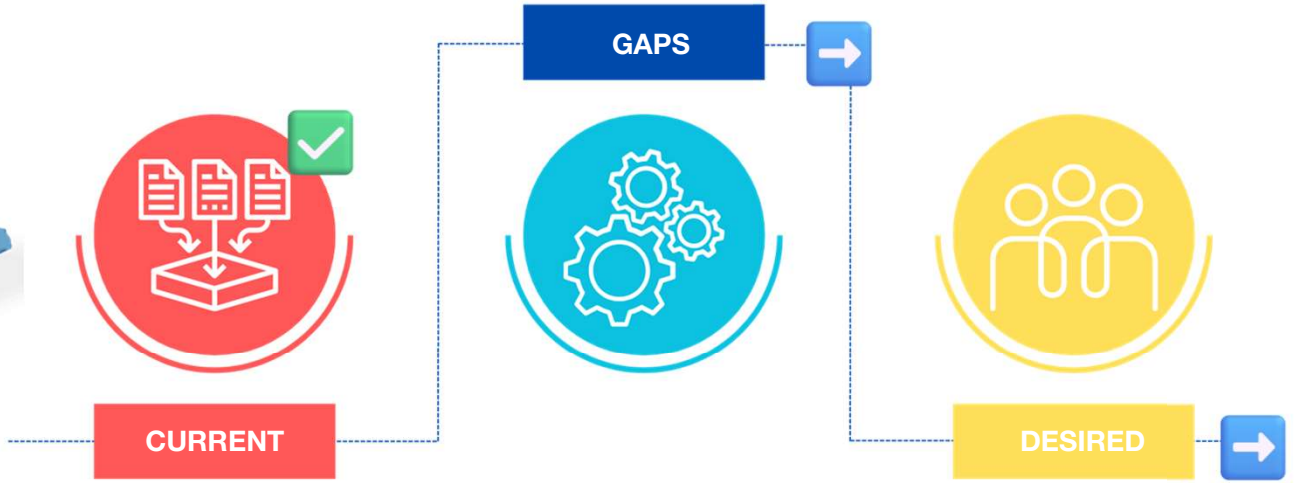
Local capacity building and knowledge products

Objectives

- At the regional level, the project activities will **support capacity development**, **outreach** and **training** as well as the dissemination of multimedia knowledge products
- Blue Pangolin Consulting will develop a **consolidated knowledge management approach** including **the production and dissemination of knowledge products,** as well as supporting the delivery of capacity building events.
- To achieve this, **four knowledge management products**, including the "*Guide on pre- and post-disaster risk management and response capacity and required regulatory framework*", will be produced, alongside support for workshops ad capacity development mechanisms

Gap Analysis

- This gap analysis process will enable the proposal of additional knowledge management products to be developed which will be reviewed and validated by the in-country coordinators. It will:
  - Highlight the specific gaps in knowledge and resources with respect to topics/target approaches and technical products; and
  - The accessibility and target audience for existing resources (from high policy-maker level to local actors).



1. Collation of resources available
2. Identification of additional resources

3. Knowledge-based gaps present in resources, missing knowledge or new thematic targets
4. Accessibility-based gaps, where knowledge exists but is not accessible by target audience

5. Creation of knowledge management approach
6. Development of required products
7. Dissemination and outreach

Knowledge Product #1: Explainer Video

- It is proposed that the first product will form a **video** that will aim to introduce the concept of insurance for financing coral reefs, address key questions to build knowledge, and include interviews from experts on its application, including:
  - What is insurance in the context of coral reef resilience?
  - How can insurance products build coral reef resilience and how can it be used as an incentive for stakeholders?
  - The types of insurance products, examples of their application, and outcomes, including barriers to their application.
  - How can insurance products form part of a suite of conservation measure to support resilient reefs?
- The video may include interviews and case study accounts from insurance providers to stakeholders and managers. This could be accompanied by a supporting document of case studies or have them integrated into other knowledge products

Possible Other Knowledge Products

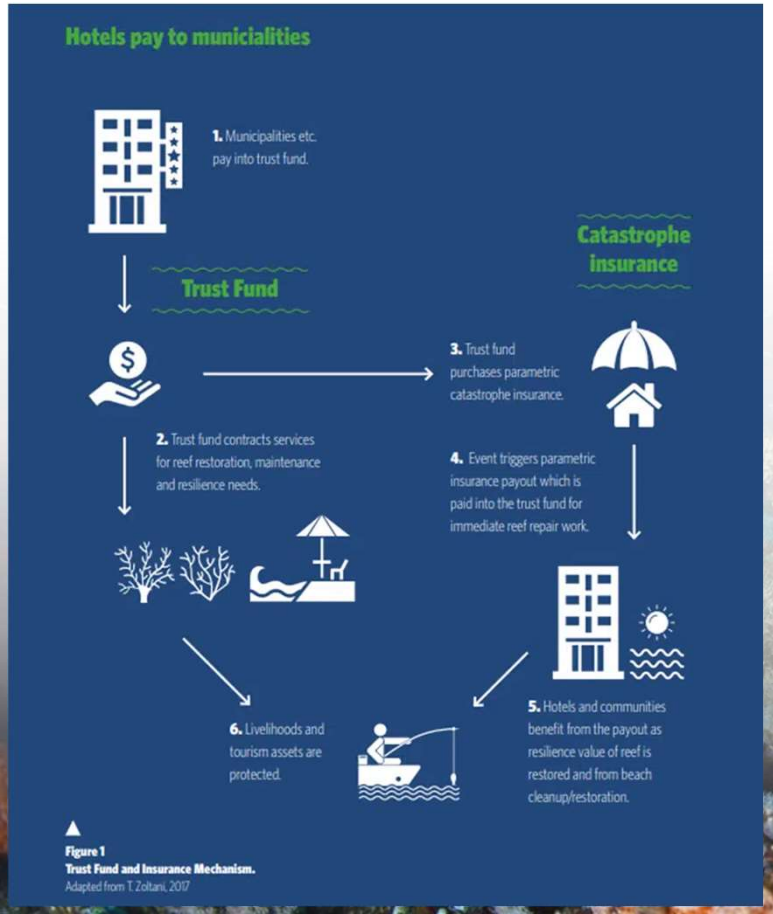
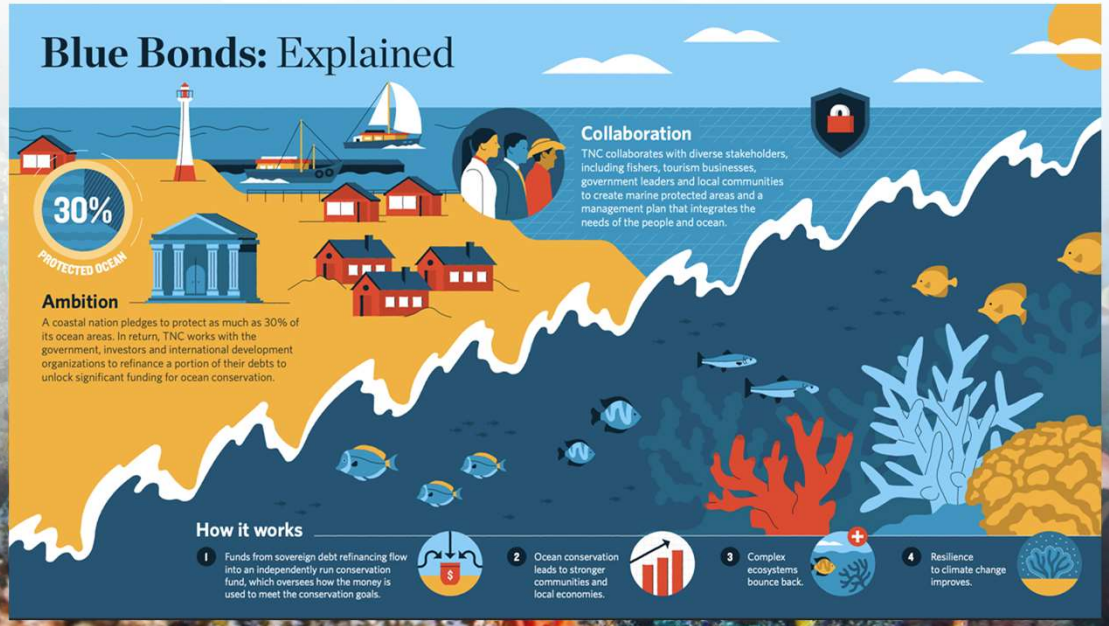


Figure 1
Trust Fund and Insurance Mechanism.
Adapted from T. Zoltani, 2017

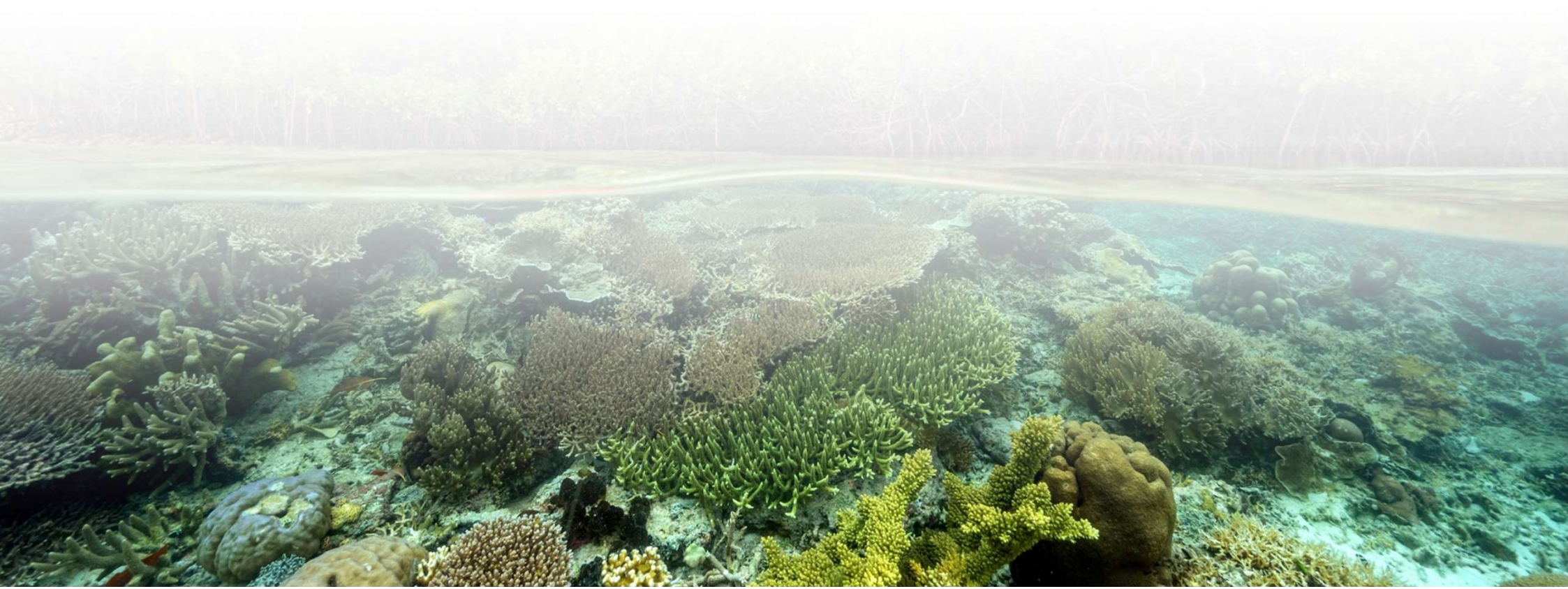


Data Needs from Stakeholders

To guide the production of further Knowledge Products, the following information is requested:

1. What is the current level of understanding on of insurance products in conservation financing, as well as coral reef resilience?
2. Are there already existing knowledge products being used in the country regarding coral reef insurance, financing and/or resilience? If so, what are they? And if not, what would be most useful?
3. What is the preferred medium for knowledge products?
    - For example, are videos and online interactive products more suitable? Or would written, downloadable (.pdf) products be more accessible?
4. Are there specific audiences for the region that knowledge products should be tailored for?
5. Should the products be available in any specific language (in addition to English)?

Discussion



Thank you

Annex – Prioritisation methods per criteria

Human Disturbances - method

Approach: To capture the full range of anthropogenic threats to coral reefs, two data layers are utilised. A combined scoring approach (next slide) has been devised to provide a representative score for this factor.

Layer 1: Local Threats to Coral Reefs, ResourceWatch

SOURCE: WRI/IMaRS USF/IRD/UNEP-WCMC/WorldFish Center,

Description: Estimated threat to coral reefs based on an index which combines the threat from the following local activities: overfishing and destructive fishing, coastal development, watershed-based pollution, marine-based pollution and damage

Note: Data is from 2011 but still best available assessment of local threats at a global scale. Once sites are selected, an updated local threat analysis is very feasible using a combination of satellite data (to measure/monitor chlorophyll-a content, sedimentation, turbidity) and any existing local data/knowledge.

Layer 2: Global Maritime Traffic

SOURCE: Global Maritime Traffic Density Service (GMTDS)

Description: GMTDS applies advanced analytics to hundreds of billions of AIS message data from multiple sources to provide a holistic view of global maritime traffic densities over time.

Note: Data is provided at monthly intervals with individual 1km cell values indicating monthly shipping hours per square kilometre. The following images show the average cell value over period of July 2022 to July 2023 (longer time series can be downloaded upon request). The data can also be broken down by shipping type (cargo, fishing, tanker, etc). The fishing and cargo only datasets were examined but the 'All' ship type category was determined to be the best for the rapid site assessment process.

Coastal Protection Value - method

- **Layer**: Index of Coastal Protection by Coral Reefs (2014), ResourceWatch
- **Source**: TNC, WRI, University of Cambridge (Cambridge), data from Spalding et al (2016).
- **Description**: This dataset is an index that estimates the relative value provided by coral reefs that protect coastlines through reduction of wave height and wave energy. The value as of 2014 is modelled as a function of exposed populations and infrastructure that received some level of protection from coastal and barrier reefs.
- **Scoring approach from ResourceWatch**:
  - 1 = mainly low
  - 2 = mainly low - medium
  - 3 = mainly medium
  - 4 = mainly medium - high
  - 5 = mainly high

  - **BUT – score for each LGU reduced by 2 for those LGUs facing west where the fetch is much smaller.**

Tourism Value - method

- **Layer**: Coral Reef Tourism Value, ResourceWatch
- **Source**: TNC/WRI/UWash/Cambridge, data from Spalding et al (2017)
- **Description**: The Coral Reef Tourism Value dataset estimates the annual economic value of coral reefs to the tourism sector. These values reflect the individual and combined value of on-reef and reef-adjacent tourism. The former includes recreational diving and snorkelling, while the latter encompasses the provision of calm waters, coral sand beaches, views and seafood.
- **Scoring approach**:
  - 1 = mainly low
  - 2 = mainly low - medium
  - 3 = mainly medium
  - 4 = mainly medium - high
  - 5 = mainly high
- Scores and information from national consultants have been incorporated. Final score is an average.

Diving/snorkelling value - method

- **The approach uses data from Dive.Site and from Caraga (2010)**
- **Layer**: Dive site frequency
- **Source**: Dive.Site
- **Description**: Dive.site is an up to date interactive map that displays all the most popular dive sites worldwide. It allows users to upload and share their diving experiences online. It is being drawn upon here as a proxy for understanding the diving/snorkelling value of each site. Sites with a high frequency and density of dive sites will receive more value from their coral reefs. The geographical information is also useful for potential divers to engage in restoration.
- **Scoring approach**:
  - 1 = No dive sites
  - 2 = Few dive sites
  - 3 = Medium frequency of dive sites
  - 4 = High frequency and density of dive sites
  - 5 = Very high frequency and density of dive sites

Fisheries value - method

- **The approach taken uses ResourceWatch** data.
- **Layer**: Coral Reef Fisheries Relative Catch (2014), ResourceWatch
- **Source**: TNC/WRI/Cambridge
- **Description**: Estimated size of local coral reef fishery catch, relative to other reef fisheries, determined as a function of estimated reef productivity and fishing effort.
- **Scoring approach**:
  - 1 = Mainly low
  - 2 = Mainly low – medium
  - 3 = Mainly medium, or even split
  - 4 = Mainly medium - high
  - 5 = Mainly high
- Scores and information from national consultants (NCs) have also been drawn upon. Final score is an average.

Organisations set up to implement it - method

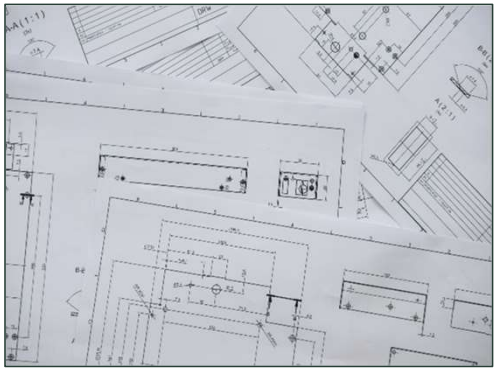
- Information provided by national consultants on the extent to which organisations at the site/region might be interested in supporting the implementation of a coral insurance mechanism.

Scoring:
1 = low level of interest & capacity to support;
3 = moderate (or unknown);
5 = high level of interest & capacity to support

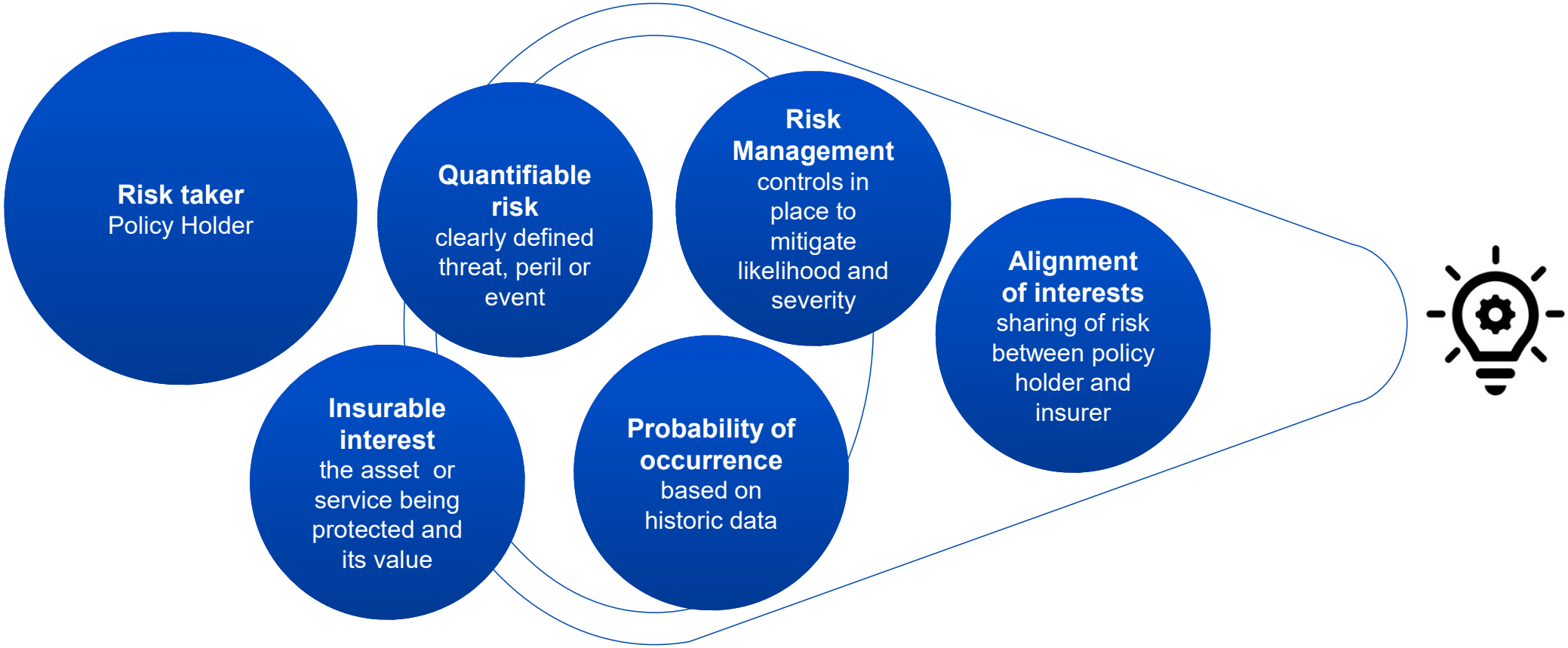
Appendix – Role and requirements for insurance

Only for clarifications if needed

The different roles of insurance and risk transfer

Insights	Enablement	Resilience Building	Compensation
			
Understand climate and physical risks and potential impacts to locations, assets and value chain	**De-risk and enable investment** by including insurance at planning stage to assure project delivery and returns	**Parametric insurance** index-based design, for early intervention, fast response post event, and recovery aid	**Traditional indemnity insurance** provides compensation for loss or damage post event

Fundamental Requirements for an insurance product

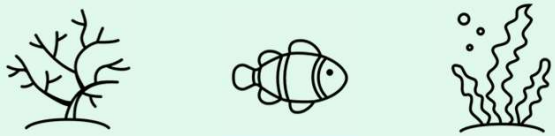


Risk Management Approaches for Natural Coastal Assets

Insurance

Financing

Asset
Coral reef, mangroves, seagrass



Hazard
Natural or man-made, direct or secondary

Risk Management Approach
Holistic risk management incorporates all three approaches

1. Avoid

- Hazards are moved or redirected away from the site
- Insights and systems to better understand and inform planning and early warning

2. Recover and Restore

- Funds from an insurance pay out, triggered by an agreed threshold or post event, can be used to repair and rehabilitate
- Cover business interruption and loss of earnings due to a disaster event
- Restoration financed by government and third parties

3. Adapt

- Funds from an insurance pay out, triggered by an agreed threshold, can be used for early intervention and 'build back better'
- Upfront investment in risk reduction measures reduce the impact of future hazards

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