

DESCARTES

Insurance innovation for Carbon Credits

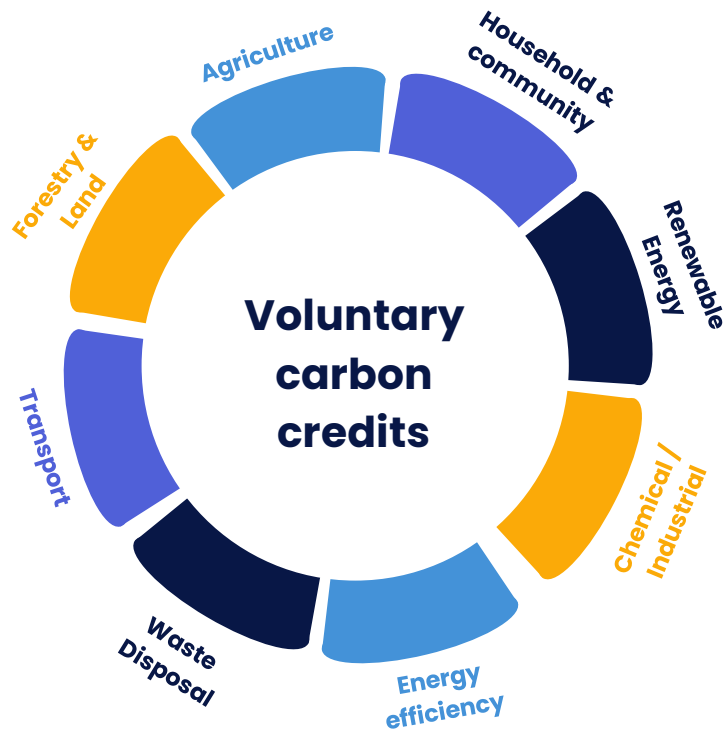
Session 2: Financial Aspects of Carbon Markets

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October 3rd, 2023

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Voluntary carbon offset projects affected by natural perils



– Technology based avoidance offsets –



Solar farms projects are exposed to:

- Hailstorms
- Tornadoes
- Hurricanes
- Straight-line winds

– Nature based carbon removal –



Agricultural carbon credits are exposed to:

- Hailstorms
- Frost
- Drought

– Nature based carbon removal –



Forestry projects are affected by:

- Wildfires
- Straight-line winds
- Droughts

Building resilience in the forestry carbon credit market amidst wildfire risk

“With trees deteriorating from droughts, heat waves, pest invasions, and wildfires amplified by global warming, relying on any particular patch of forest to store carbon for decades to come is becoming increasingly difficult”¹



By 2030 carbon credit demand will increase

x15

or by a factor of up to 100 by 2050

-Institute of International Finance

By 2030 the market could be worth

+\$50bn

-Institute of International Finance

In less than a decade, wildfires destroyed **95% of California forest “buffer pool”**

- CarbonPlan

1980–2021: USA suffered 20 catastrophic wildfires causing +\$1bn in losses

(16 occurred in the last 20 years)

- Cal Fire



Forests acting as natural sinks depend on **factors outside of governments’ & developers’ control**



Demand increases from financial initiations, brokers & individual consumers on **understanding how climate risks affect CC projects**

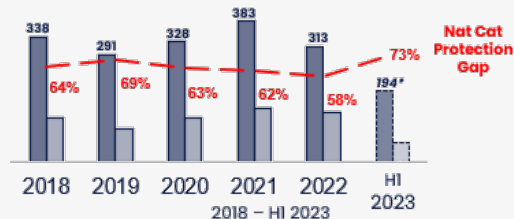


Stakeholders are seeking out more **climate risk insurance products that can adapt to each project’s needs**

The future of insurance against a changing climate & risk landscape

1 Climate risks & losses are increasing

... Corporates & governments are struggling to **find capacity to insure exposed areas**



Global Economic Nat Cat Losses vs Global Insured Nat Cat Losses (bn USD)

A high share of Nat Cat losses remain uninsured

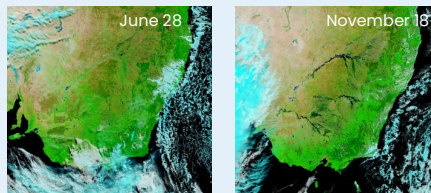
Last year alone, economic losses reached \$313bn, with only \$132bn insured

Source: Aon NatCat Report 2023

2 The impact of climate risks is difficult to predict

The traditional market does not consider **seasonal & inter-seasonal climate variabilities**

2022 NSW Australia floods



Source: MODIS

Conventional underwriting methods **rely heavily on historical loss records**, preventing them from adequately modeling & pricing **climate risk**

3 ... and claim management is lengthy & complex

18-24 months

average claims adjustment after a Nat Cat event

Exclusions

leading to misunderstandings (e.g., pandemic vs. epidemic)

NDBI uncovered

Traditional does not cover intangible losses

Satellite technology advancing the insurance market



Unlocking access to more granular, precise atmospheric & meteorological data to enhance our understanding of emerging risks

PARAMETRIC INSURANCE – RISK MODELING

- **More realistic modeled events, capturing a variety of results:** supporting the modeling of ‘worst case’ scenarios
- Satellite imagery advancements provide insights **that accurately reflect the insured location’s characteristics**
- Satellite-based reanalysis data provides **historical timeseries in remote places** where insurance claims have never been registered

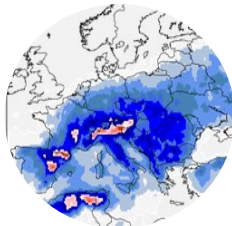
Cyclone



Enhanced estimation of crucial parameters

Source: NHC

Hail



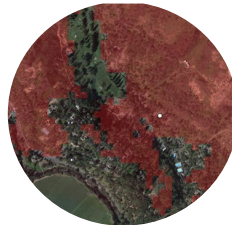
Classification of hail probabilities and stone size

Source: Descartes

PARAMETRIC INSURANCE – POST EVENT DAMAGE ASSESMENT

- Satellite observations can overcome limitations of numerical weather models
- No manual claim adjustment
- Data shortly available following an event ensures quick indemnity for our clients

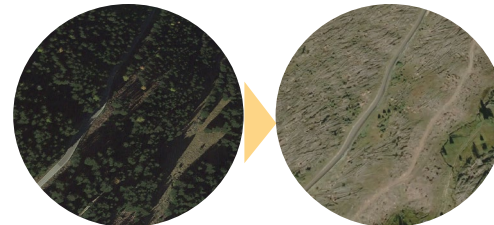
Wildfire



Detection of burnt areas

Source: Landsat

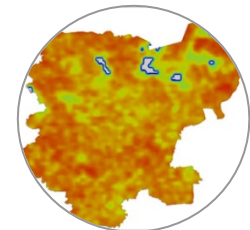
Damage detection



Recognition of wind damaged areas

Source: CNES/Airbus

Drought



Lack of soil moisture exposure

Source: ERA5

Protecting carbon offset plantations through data-driven insurance

Our parametric wildfire product can secure carbon credit inventory against all forms of **physical & financial loss** following a wildfire event

Descartes' Parametric wildfire cover

Index:

Satellite imagery detects burnt areas and fire severity

Data provider:

MODIS and/or Sentinel

Risk modeling:

Considers 50+ parameters to assess wildfire risk exposure using physics-based models, for example:



Climatic parameters



Topographic parameters



Human parameters



Natural parameters

Payout Example

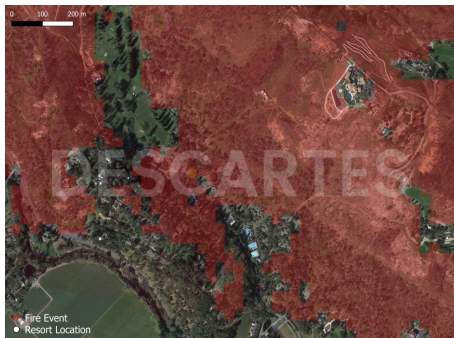
Value per hectare agreed up front

- **Insured area:** 50,000 acres
- **Pre agreed value per acre:** \$1,000 (determined by loss of future carbon credit revenues)

Payout in case of a fire:

- **Burnt area:** 10,000 acres

The client receives a 10,000 acres x \$ 1,000 = \$ 10M payout



Source: Landsat



Event Occurs



Data Collection



Declaration of Loss



Event Report



Payment Issued

Descartes Underwriting

The future of insurance against a changing climate & risk landscape

Descartes' Value Proposition



Next Gen Underwriting

Structured as a Managing General Agent, we write on A rated paper supported by best-in-class (re)insurers.



Deep expertise in climate risk

Supported by an industry leading team of 160+ PhDs, natural risk modelers, data science engineers, and insurance professionals



Data-driven approach

We incorporate advanced technology and machine learning to model the underlying phenomena directly, better capturing trends and climate change impacts



Diverse global footprint

We collaborate with brokers around the world to protect their corporate & public sector clients against the full spectrum of Nat Cat & extreme weather events

To support the financial resilience of corporates & governments worldwide



Large Capacity

\$75 - 200M USD

available
per policy



Client Base

Trusted by

350+ clients

worldwide



Product Suite

Over **14+** products
against primary &
secondary exposures



Global Presence

Team spanning
**14 international
hubs**

Parametric insurance, an innovative solution for the **Carbon Credit Market** to address natural perils



- 1** Natural risks are increasingly affecting the fast-growing Carbon Credit Market
- 2** Satellite data is key to building more reliable, accurate, and granular risk models for natural perils
- 3** Thanks to satellite imagery, **parametric insurance** provides quicker and more transparent claim assessments, providing immediate relief fund after a shock

Thank you

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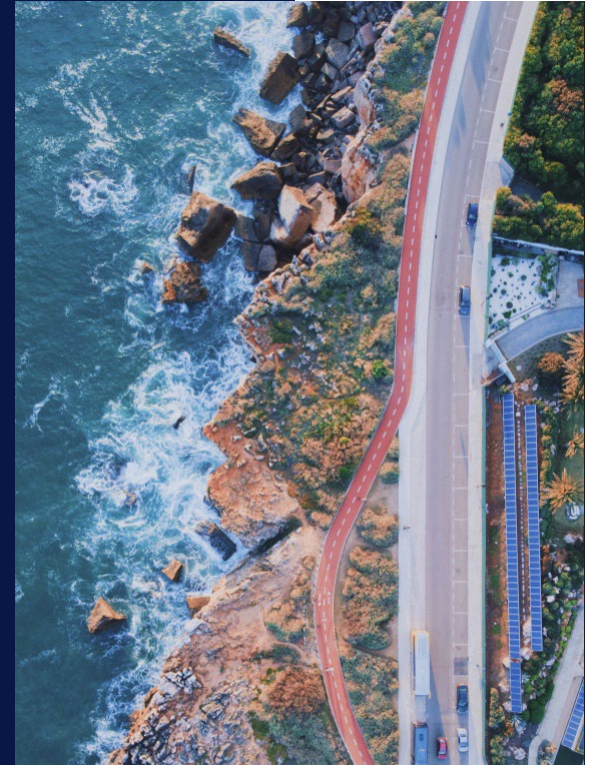
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