Oasis Loss Modelling Framework -

Changing the landscape of catastrophe loss modelling

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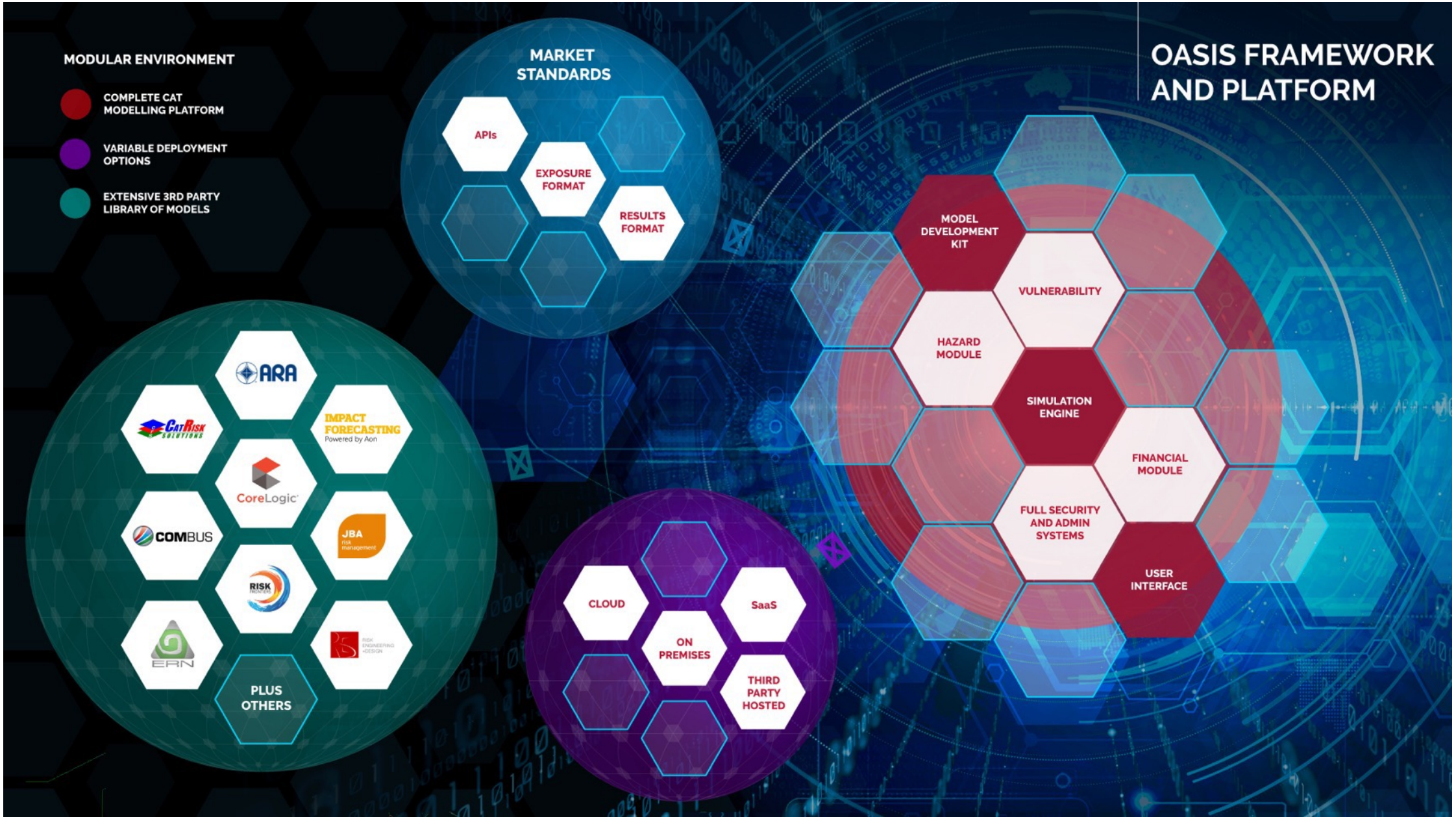
The mission to accelerate adoption for the benefit of all

Improve risk assessment through better models, transparency, performance, and innovation

Provide open-source software and an open framework for model and software development

Establish a commercially vibrant community of providers and users of Oasis software, models, data, and tools


MODULAR ENVIRONMENT
COMPLETE CAT MODELLING PLATFORM
VARIABLE DEPLOYMENT OPTIONS
EXTENSIVE 3RD PARTY LIBRARY OF MODELS
MARKET STANDARDS
APIs
EXPOSURE FORMAT
RESULTS FORMAT
ARA
CatRisk Solutions
IMPACT FORECASTING
Powered by Aon
CoreLogic
COMBUS
JBA risk management
RISK FRONTIERS
ERN
PLUS OTHERS
CLOUD
SaaS
ON PREMISES
THIRD PARTY HOSTED
OASIS FRAMEWORK AND PLATFORM
MODEL DEVELOPMENT KIT
VULNERABILITY
HAZARD MODULE
SIMULATION ENGINE
FINANCIAL MODULE
FULL SECURITY AND ADMIN SYSTEMS
USER INTERFACE

Benefits of Oasis

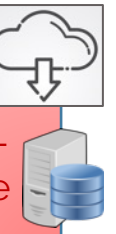
One standard platform for the (re)insurance industry and all modelling companies that delivers:

✓Cost reduction ✓ Performance and reliability
✓ Efficiency, consistency and transparency

Benefits of Oasis

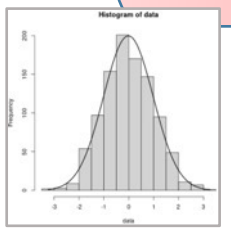
Model execution through an API framework for full integration into internal systems or through a User Interface (UI).

Flexible deployment options: cloud-based, on-premise, locally, Software as a Service (SaaS).



Industry owned and driving development priorities.

Industry tested and comprehensive financial module (FM) to ensure consistent interpretation of financial terms across models.



Choice of 100's of models from many providers.

Utilises to the Open Data Standards (ODS) - input and output data is compatible across all models.

ODS
Open Data Standards

Oasis Members

Oasis Projected Model Coverage

Over 90 models from 19 providers

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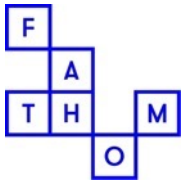


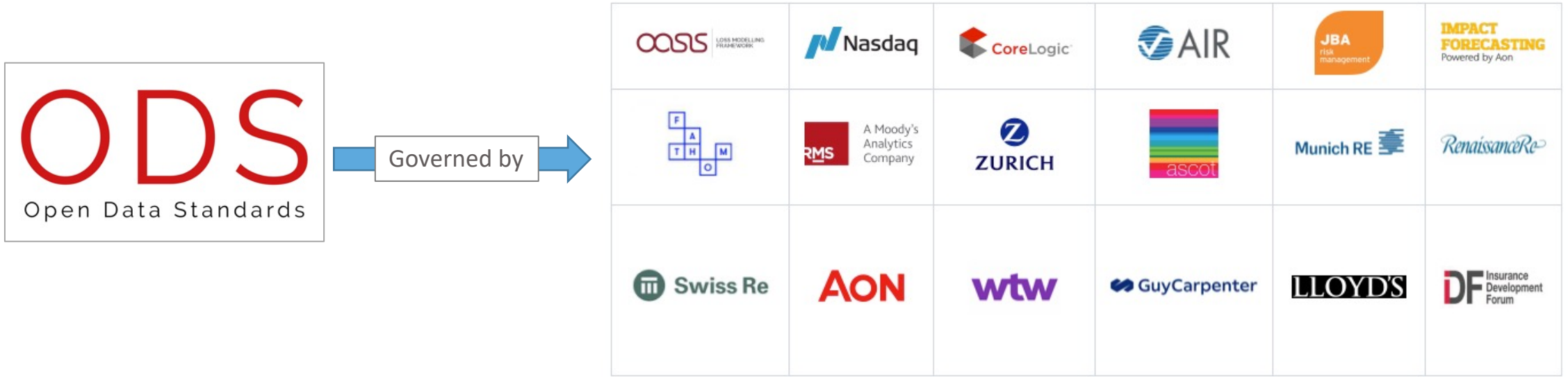
* JBA – 'Global flood model' available on the Oasis platform (except Antarctica)
CoreLogic – Committed in making all models available on the Oasis platform

Open Data Standards (ODS)

An open and transparent modelling data standard, developed and governed *"by the market for the market"*.
NOT AN OASIS STANDARD. ODS encompasses (but not limited to) **Open Exposure Data (OED)** & **Open Results Data (ORD).**

- ODS is model agnostic and designed to help solve interoperability problems while improving efficiency and transparency, especially with data transfer and cross-model analytics.

- Governed by the ODS Steering Committee (SC) made up of attendees from the following companies:



- Incorporating standard data capture for public sector/humanitarian use cases such as population/demographic data, infrastructure and agriculture.
- Open and free to use https://github.com/OasisLMF/OpenDataStandards and https://oasislmf.org/open-data-standards

key issues to consider

What standards are required for the use case you have

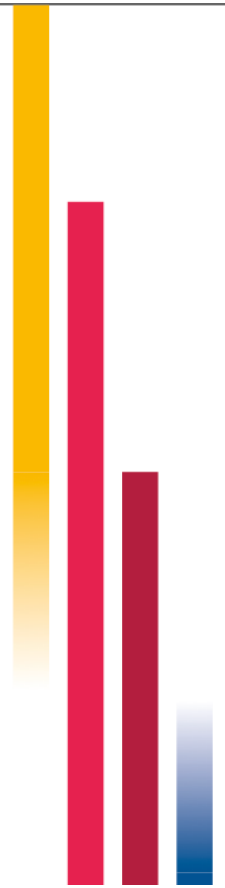
- Exposure standards
- Model standards
- Results Standards
- Climate change

http://lighthillrisknetwork.org/wp-content/uploads/2023/02/2022_CRC_BestPractices_ClimateChange_FINAL.pdf

Model needs and function

Table 3.1: Choice of risk analytics approaches

Risk management application	Financial risk layering	Example risk context to be analysed	Primary risk analytics methodology
Local response planning Community education and alerts	Setting local contingency funding	Low severity event with very local impact e.g. flood event with 1-2 year return period.	
Social and environmental protection measures eg building code development	Setting national contingency funding, contingent credit Insurance and other risk transfer instruments based on single hazards Humanitarian anticipatory finance	Moderate-severity events. Risk knowledge is generally greater than uncertainty. e.g. 5-20 years return period losses for a coastal storm affecting a limited number of communities	
National response planning Infrastructure adaptation projects	Cost/benefit analysis of risk prevention projects. Determination of threshold where investment in risk prevention is more cost effective than residual risk financing. Insurance and risk transfer instruments based on multiple hazards. Regional risk pools.	Low frequency single hazards or higher frequency compound hazards. Large to profound impacts on local infrastructure and economies requiring provincial to national scale government intervention e.g. 20-50 years return period losses at provincial/state level for an earthquake causing significant loss of life and damage	



Legend

- Hazard maps, hazard observations record, live observations, local impact records, indigenous knowledge
- Probabilistic catastrophe models. Models are improved if calibrated to local vulnerabilities, and hazard and loss experience. Metrics may include risk to property, crops, population.
- Catastrophe models conditioned to reflect frequency and severity under different climate warming pathways. 'Resilience models' reflecting the benefit of risk prevention measures. Cost / benefit analysis of investment in adaptation eg: Economics of Climate Adaptation studies.
- Use of scenario analysis to complement probabilistic approaches
- Parsimonious scenario approaches, use of contradictory assumptions including behavioural models
- Novel decision-making approaches for conditions of deep uncertainty: eg behavioural/agent-based modelling, game theory, dynamic adaptive approaches. See for example Marchau et al, 2019[5]

Performant , reliable, scalable

- Key goals are Performance and reliability
- 10 years of development have produced best of breed only distributable cat platform
- Open Financial module, specified by the market
- User defined Dev backlog, available on GitHub
- Fastest platform on the market

Oasis Software – four main components

Oasis software supports model development, model deployment and model operation for insurance and government/third-sector organizations.

1 - Oasis Platform (ktools + API)

This is a set of data standards, an API, tools and components for building and running catastrophe models. This is the core part of the system and underpins the other components. The encompasses the catastrophe modelling specific simulation kernel, where the majority of the domain specific code and optimization is required.

2 - Oasis User Interface (Flamingo)

This is a web based application for uploading exposure, running models deployed in Oasis, and retrieving results. It is targeted at model evaluation; operation in conjunction with existing exposure management and reporting tools; and modelling use in government or third sector contexts.

3 - Oasis Model Development Kit

This is a set of tools for building, calibrating and creating the deployment assets for model, ready to be deployed into an Oasis system. It is designed with a model developer or academic user in mind, who are likely to be comfortable working directly with the data from the command line on an analysis server.

4 - Oasis Model Library

This is a hosted catalogue for Oasis models. It is centrally hosted in AWS. It allows user validation of model operation within Flamingo and scalability testing and regression of the model running in ktools.

Plus build system and documentation

Oasis Software – key use cases

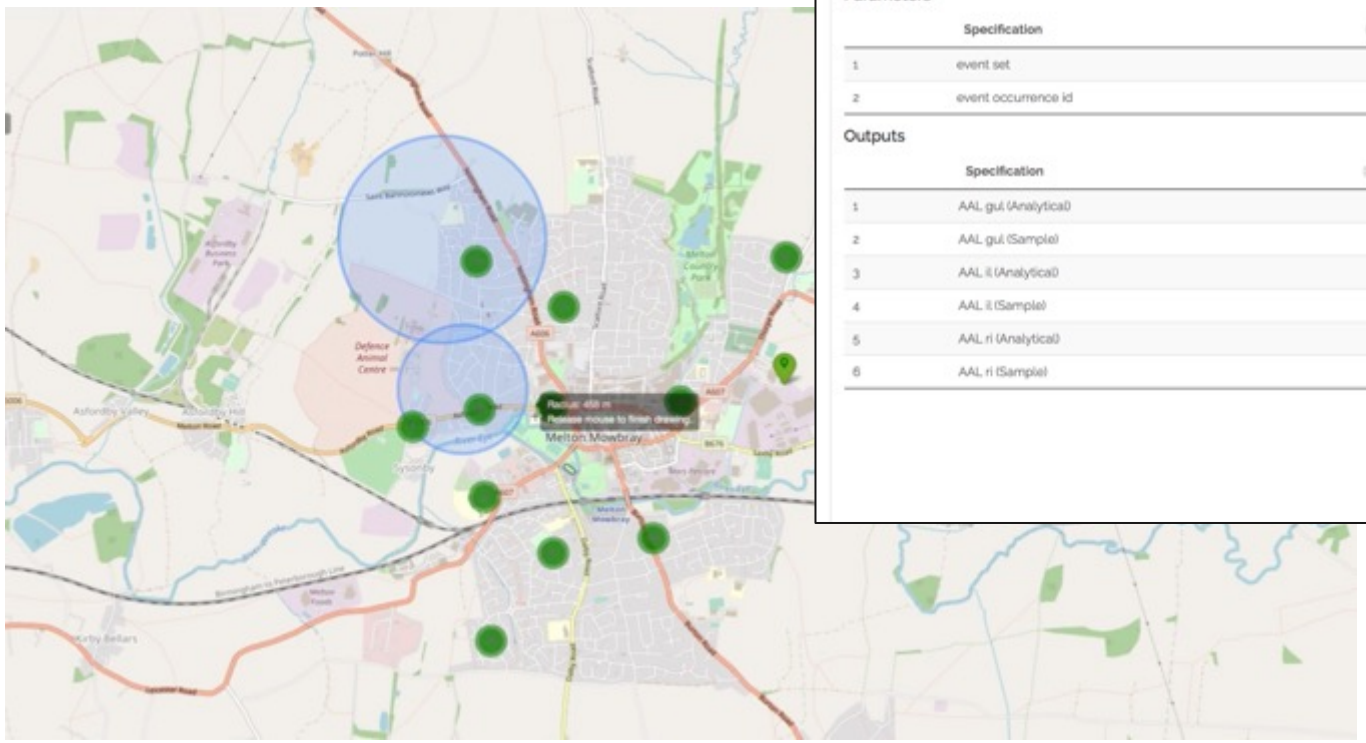
As a **Risk Analyst** I use the **Oasis UI** to execute models deployed on the **Oasis Platform**. I upload exposure data in OED format and retrieve results in Oasis format.

As a **Model Developer** I use the **MDK** to build and test models adhering to the **Oasis Platform data standards**. I use the **MDK** to deploy model version to the **Oasis model library**.

As a **Software Engineer** I use the **Oasis Platform API** to integrate models deployed on the **Oasis Platform** with other risk systems.

As a **Systems Engineer**, I use deploy and operate the **Oasis Platform** and rollout models versions from the **Oasis model library**.

User Interface (UI)



Summary | Plots | Files

Inputs

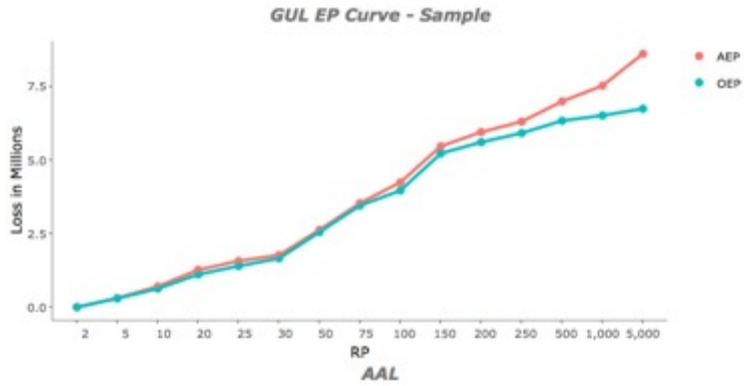
	Specification	Value
1	exposure location count	10
2	total TIV	3,400,000
3	modelled locations	10

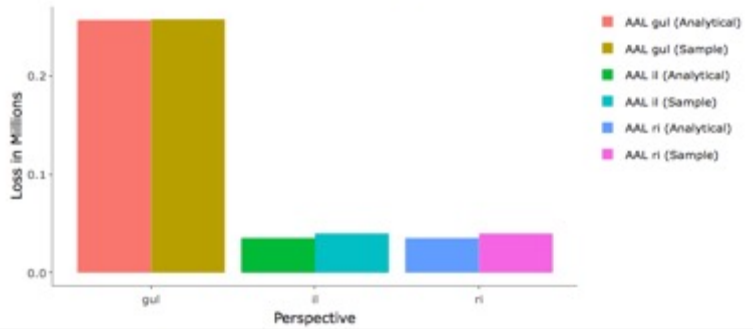
Parameters

	Specification	Value
1	event set	p
2	event occurrence id	it

Outputs

	Specification	Value
1	AAL gul (Analytical)	256.799
2	AAL gul (Sample)	257.437
3	AAL il (Analytical)	35.284
4	AAL il (Sample)	39.876
5	AAL ri (Analytical)	35.284
6	AAL ri (Sample)	39.876





Oasis Deployment Options

Flexible deployment options

The following partners offer commercial services, consultancy and support with running models on the Oasis Loss Modelling Framework

Cloud Base

Azure

amazon web services

Google Cloud

...and more

ON PREMISE AND LOCALLY

Software as a Service (SaaS)

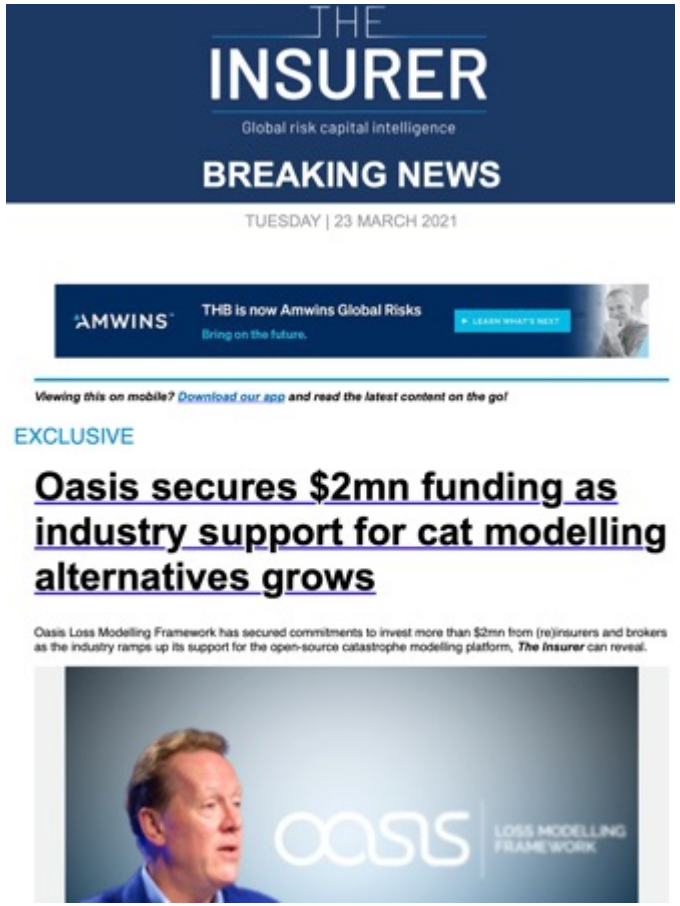
Nasdaq

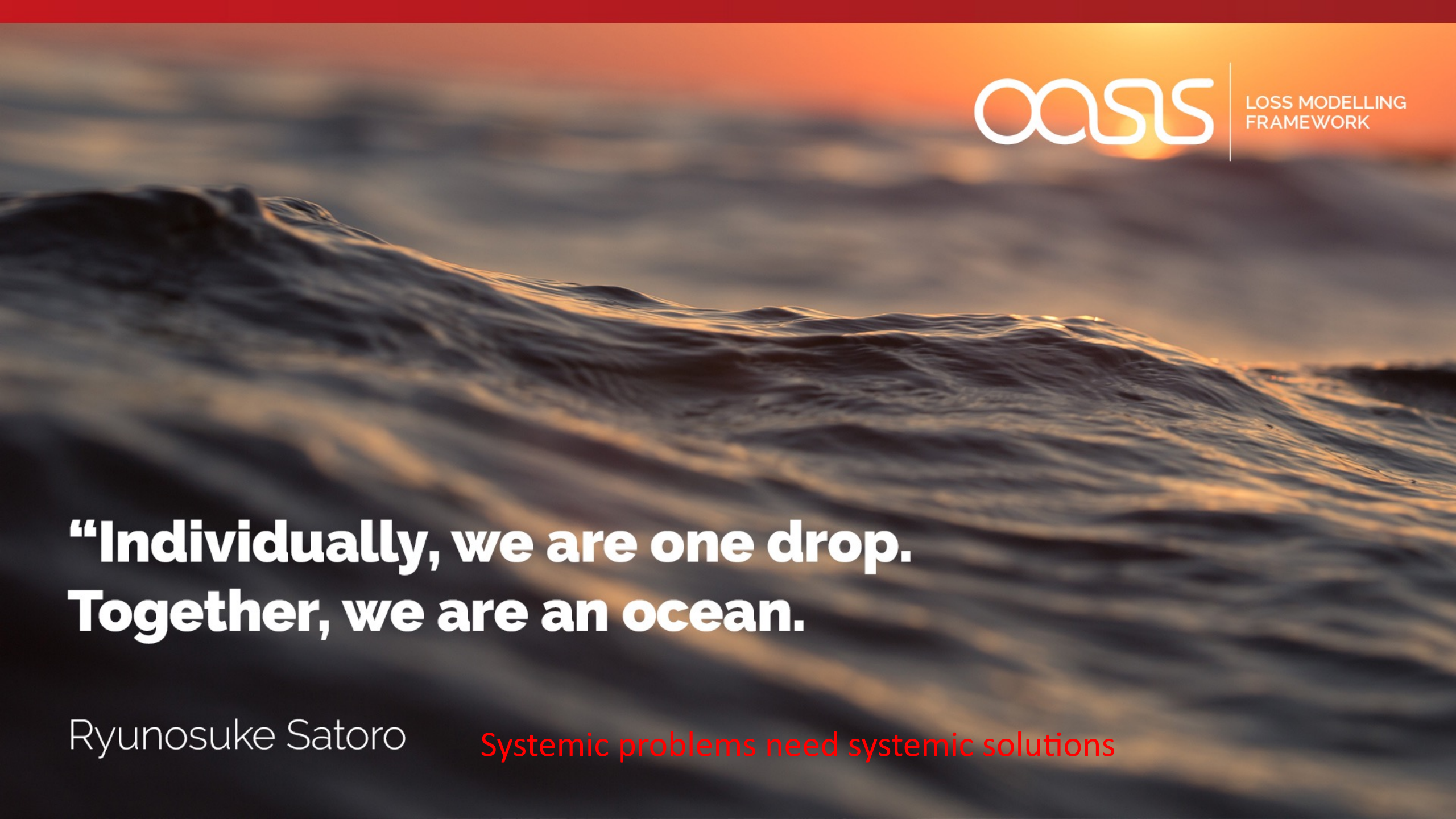
Risk Modelling For Catastrophes (NMRC)

IMPACT FORECASTING
Powered by Aon

XCEEDANCE

http://www.insdevforum.org/wp-content/uploads/2020/12/IDF_Risk_Analytics_21Dec.pdf




LOSS MODELLING
FRAMEWORK
“Individually, we are one drop.
Together, we are an ocean.
Ryunosuke Satoro
Systemic problems need systemic solutions