Swiss Re Institute

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Novel usage of remotely-sensed flood footprints in the re/insurance sector

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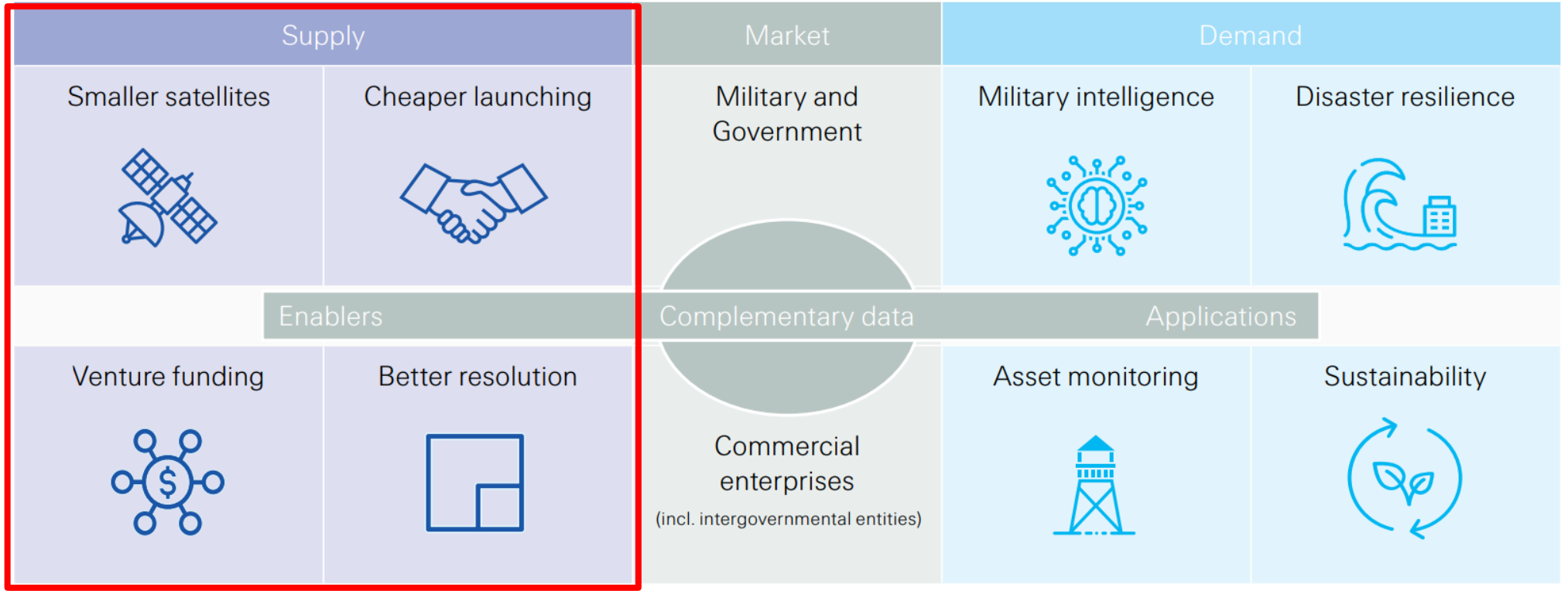
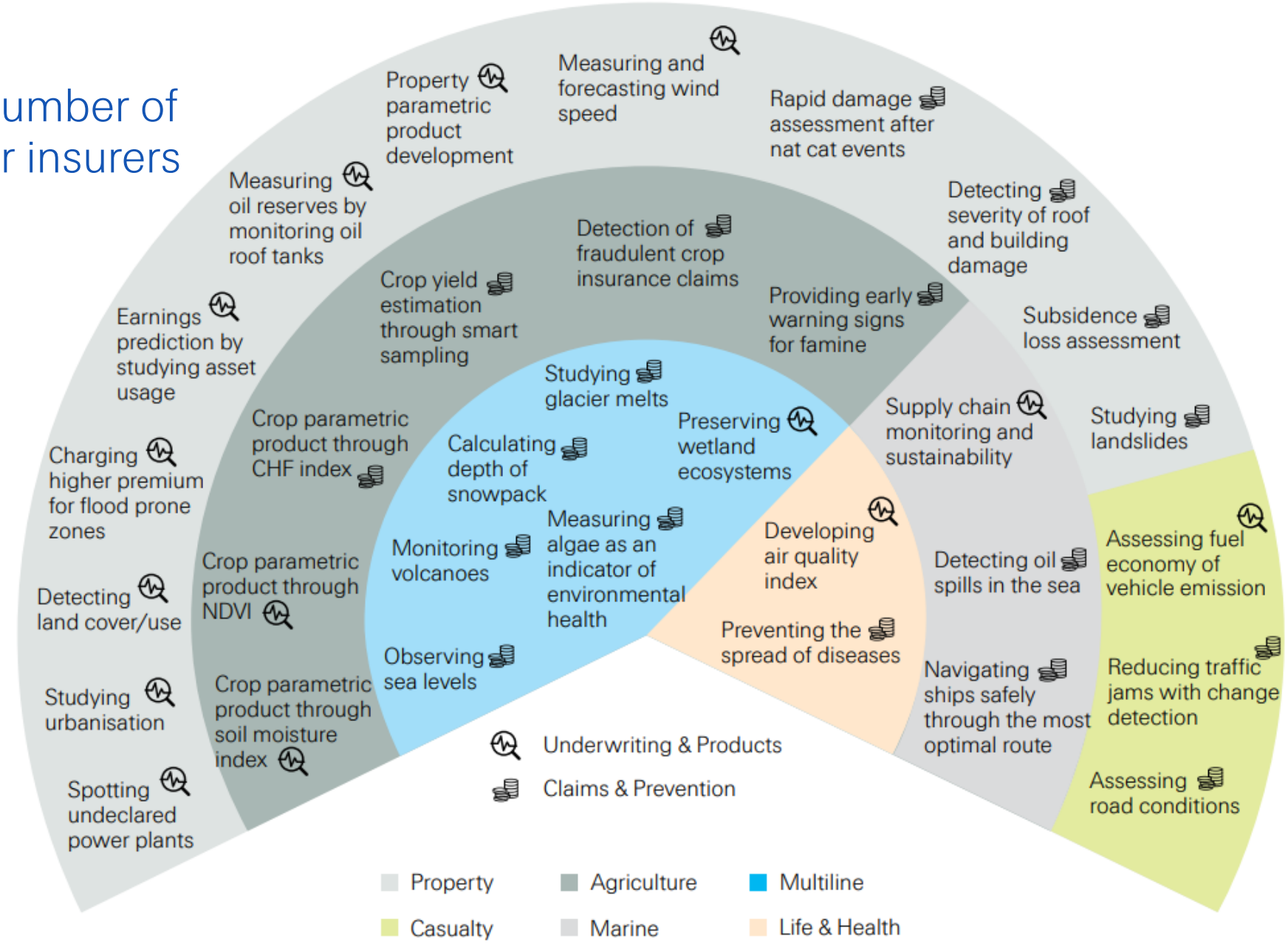
Remote sensing has been used for decades in risk modelling, but recent supply side developments are making it more accessible



Source: Swiss Re Institute

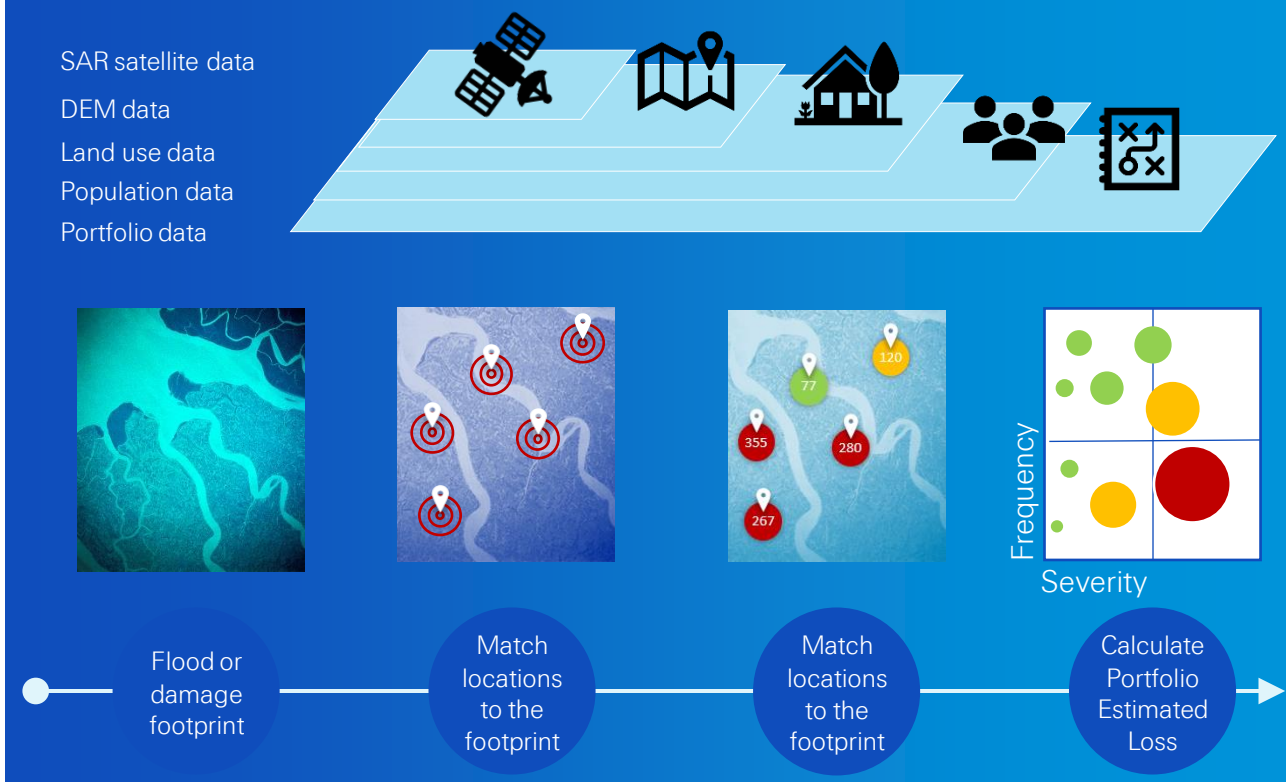
Increasing number of use cases for insurers



Source: Swiss Re Institute

Use case 1: Rapid damage assessment after large scale flood

- **Remote sensing technology**– Flood maps enabled by both passive and active (SAR) remote sensing.
- **Benefits** – Faster decisions on claim admissibility and settlement. Better reserving and lower moral hazard.
- **Challenges** – Measuring peak flood height and time for which water stands still.
- **Future applications** – Loss prediction and risk monitoring. Deployment and planning of claims adjusters to detect affected policy owners.



Source: Swiss Re Institute

Leveraging footprints to quantify losses quickly sits at the core of Rapid Damage Assessment

Disaster planning
Flood mapping to understand exposure

Flood Footprint
Derived from remote sensing imagery

Identify affected regions
Maps for more efficient claims management

Loss Estimate
Available <1 week after an event

Pre-disaster risk monitoring

Flood footprint

Match locations to the footprint

Generate statistics and maps

Calculate Estimated Portfolio Loss

Understanding of exposure

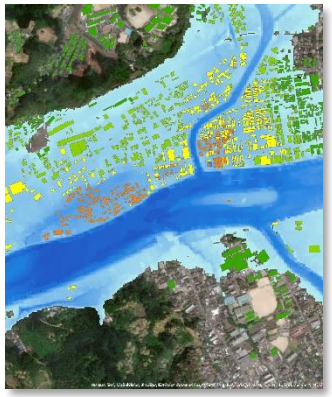
Risk Assessment and Pricing

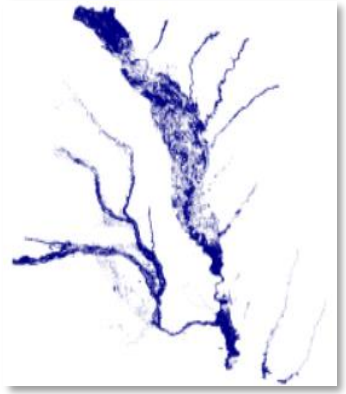
Disaster monitoring

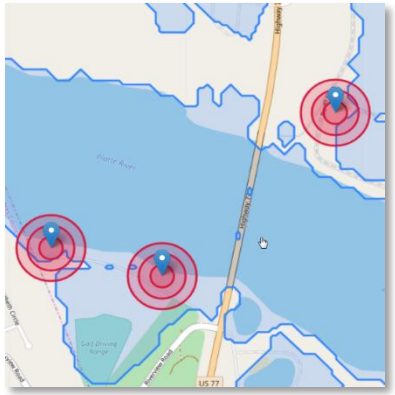
Damage Assessment

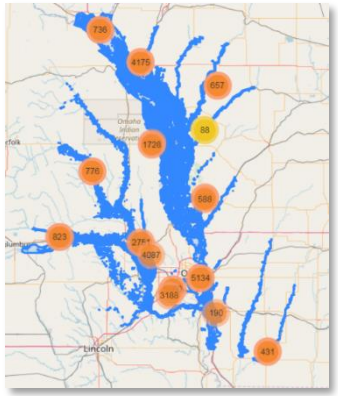
Claims adjustment

Monitoring and Analysis









$ XX in estimated loss

Use case 2: flood parametric insurance, a novel insurance coverage for large regions or multiple locations

Pre-defined locations: are they flooded?*

*Alternative approach: what percentage of pre-defined area is flooded?

Payout Table

- Illustrative and Conceptual -

Site	Latitude	Longitude	Insurance limit	Affected by floods
1	51.5	-2.5	1 million	✓
2	54.0	0.2	2 million	✗
3	53.4	-1.0	1 million	✓
4	52.1	0.5	1 million	✓
5	50.5	-1.3	5 million	✓
n	...	...	...	✓
Limits total			**45 million**	
Annual deductible			**2 million**	
Annual policy limit			**20 million**	

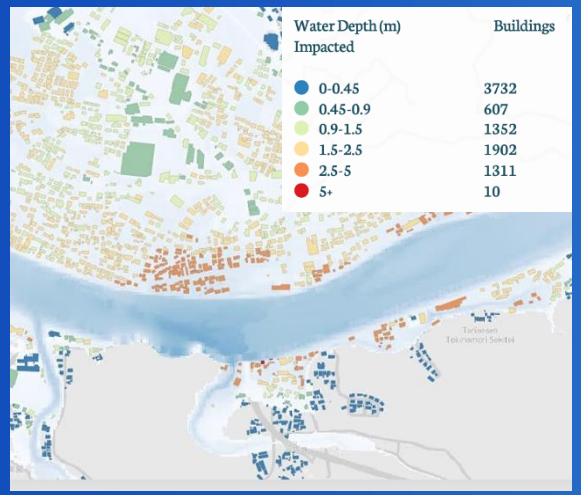
Limitations:

- Floods with a duration of <12 hours (case of very quick floods, such as dam openings/breaks)
- Floods with an area size <0.1 km^2 (~300x300 m)
- Floods with water depths <10 cm

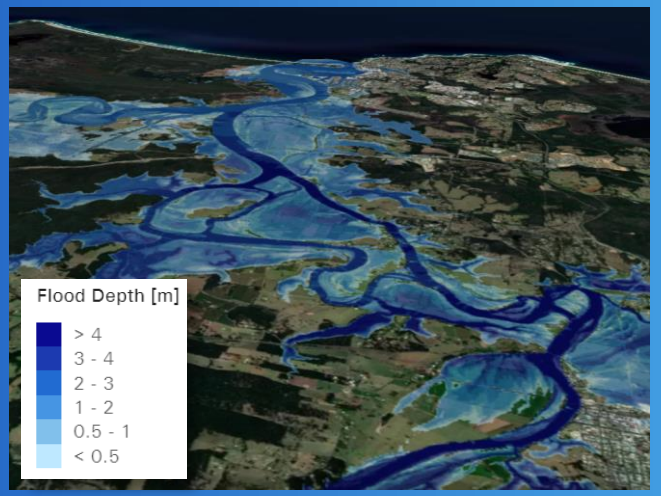
Flood event footprints partnering with ICEYE

Maximum flood extent: Our new data product addresses **flood** risk transfer and management at the root.

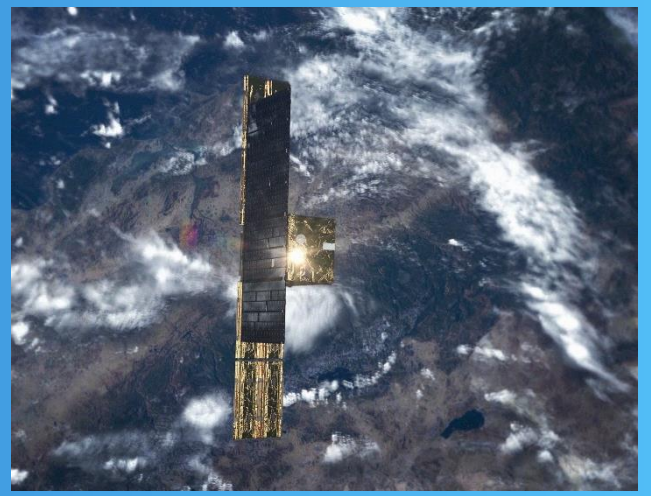
Satellite data
Global flood data based on advanced SAR satellite technology and other sources



Object level
Very high spatial resolution up to 1x1 meter



Daily observations
Any non-permanent water for >12 hours will be detected



Cloud free
Radar technology sees through clouds and works at night

Partner with us to implement this new set of index insurance products in your region

Sources: CatNet, ICEYE

Any questions?

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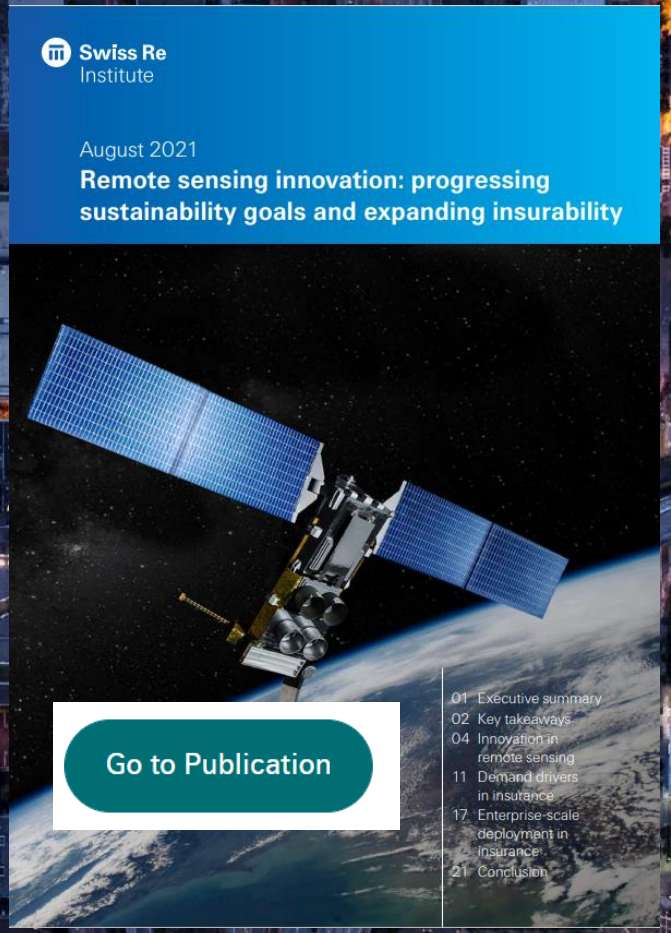

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