



EUROPEAN SPACE AGENCY

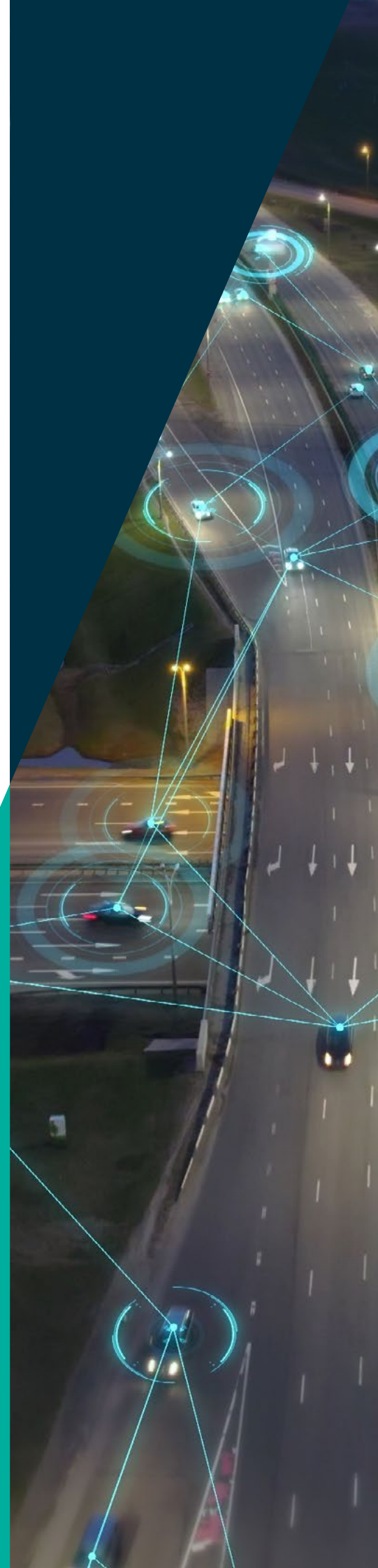
SPACE FOR FINANCE AND INSURANCE

OVERVIEW OF BASS FINANCE
AND INSURANCE ACTIVITIES



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CONTEXT

Finance and Insurance are undergoing a rapid transformation as **exposure to climate-related and natural hazard risks** increases alongside **sustainability requirements**. At the same time, institutions are adapting to **new types, volumes, and ways of processing data**. Both sectors are **emerging as major users of space-based information** with environmental and economic intelligence guiding sustainable investment and reporting in finance, and satellite data enhancing risk modelling, asset monitoring, and post-event assessment in insurance.

Business Applications and Space Solutions (BASS), part of ESA's ACCESS programme, is supporting this transition. BASS enables companies across Europe to develop space-enabled services that strengthen core financial and insurance operations, improve transparency and compliance, and open new pathways for sustainable growth. **As finance and insurance influence the allocation of capital and the management of risk across the economy, any advancements have the potential to influence best practices, investment decisions, resilience, and innovation beyond the sector itself.**

This dossier provides the first comprehensive overview of contracted activities in the Finance and Insurance domain under BASS, from its inception in 2010 to the end of 2025.



TRENDS AND CHALLENGES

The finance and insurance sectors continue to be shaped by global risks, technological progress and changing customer expectations, responding to impacts from extreme weather events, geopolitical developments, geoeconomic confrontation, economic uncertainty and cyber threats. These industries are increasingly operating in an uncertain, complex environment where risk is multifaceted, systemic, and rapidly evolving.¹



Traders, lenders, and insurers increasingly rely on timely, independent information to monitor assets, commodity flows, and vessel activity.

Geopolitical and Regulatory landscape

The geopolitical landscape is changing. Conflicts increasingly affect financial and insurance markets by disrupting supply chains, commodity markets, and shipping operations. These challenges are exacerbated by trade-policy uncertainty, inflationary pressures, and rising claims costs. Traders, lenders, and insurers increasingly rely on timely, independent information to monitor assets, commodity flows, and vessel activity.²

Regulatory frameworks such as the EU AI Act, Digital Operational Resilience Act (DORA), and the proposed Financial Data Access (FiDA) framework are strengthening requirements for AI governance, operational resilience, and data sharing while enabling new data-driven business models. At the same time, changes to the Corporate Sustainability Reporting Directive (CSRD), under the EU Omnibus Package, are shifting demand from compliance-focused ESG services towards solutions that deliver demonstrable business value beyond regulatory reporting. These include improved risk management, operational efficiency, or strategic decision-making.³

1. WEF, Global Risks Report 2025; OECD, Global Insurance Market Trends 2025; IAIS, Global Insurance Market Report 2025; EIOPA, Financial Stability Report, December 2025

2. IMF, Global Financial Stability Report, April 2026; Marsh, Geopolitical Risk: Middle East Conflict, 2026

3. Directive (EU) 2026/470; Council of the EU, Council and Parliament strike a deal to simplify sustainability reporting and due diligence requirements and boost EU competitiveness, 2025.

Climate Change Impacts

Catastrophe and climate-related risks are both increasing in frequency and severity and are becoming a material concern for insurers, financial institutions and policy makers, driving growing demand for climate-risk intelligence and adapted business continuity management.⁴ Weather and climate-related extremes have already caused significant losses worldwide.⁵ In the European Union, natural disasters have resulted in an estimated €822 billion in damages between 1980 and 2024, with a quarter of these losses occurring since 2021.⁶ At the same time, between 22% and 46% of insurers' general account assets are exposed to climate-related risks, while a significant insurance protection gap persists.⁷

These developments have important implications for insurers, financial stability and risk management practices, and are increasingly reflected in regulatory and industry responses. For instance, several European countries have mandatory insurance schemes

covering specific natural catastrophe risks, such as France's established *CatNat* scheme and Italy's mandatory business natural catastrophe insurance framework introduced under Interministerial Decree No. 18 of 30 January 2025. These trends are driving growing demand for climate-risk intelligence, such as quantifying asset-level exposure or wildfire risk, as well as for innovative risk-transfer mechanisms, such as parametric insurance.⁸

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Raging fires across Portugal, September 17 2024
Image credit: contains modified Copernicus Sentinel data (2024), processed by ESA

4. OECD, Global Insurance Market Trends 2025; EIOPA Sustainable Finance Conference, 28 April 2026; UNDRR, Global Assessment Report 2025
5. WMO, Atlas of Mortality and Economic Losses from Weather, Climate and Water-related Hazards (1970-2021), 2023
6. EEA, Economic losses from weather- and climate-related extremes in Europe, 2025
7. IAIS, Global Insurance Market Report 2025; EIOPA, Dashboard on insurance protection gap for natural catastrophes
8. European Commission, OBSERVER: Copernicus supports the Finance and Insurance Sectors in Monitoring climate-related risk, 2022

Technological Innovation

Technological change and innovation are both a challenge and an opportunity. Financial actors face cyberattacks, financial fraud, evolving customer expectations, and the complexities of transforming core systems, while also having opportunities to benefit from improved data infrastructure, information processing, simplified processes, faster claims validation, and more personalised products.⁹

New insurance models are emerging, such as pay-as-you-live products in life insurance and microinsurance solutions for emerging and developing markets.¹⁰ In mobility, autonomous vehicles are creating new insurance coverage and liability considerations while advanced sensors are providing more detailed data to support accident analysis.

As the Earth observation market becomes more mature, finance and insurance are making increasing use of space-based, geolocated, and independently verifiable data, supporting more granular risk intelligence across underwriting, trading, and risk management. At the same time, organisations increasingly expect integrated, sector-specific solutions that combine validated analytics, domain expertise, and operational reliability, while openly accessible European geospatial data is gaining increasing importance.¹¹



In mobility, autonomous vehicles are creating new insurance coverage and liability considerations while advanced sensors are providing more detailed data to support accident analysis.



9. OECD, Global Insurance Market Trends 2025; EIOPA, Financial Stability Report, December 2025; IAIS, Year in Review 2025

10. Deloitte, 2026 global insurance outlook

11. EUSPA, EU Space Market Report, 2026

VALUE OF SPACE

Space-enabled solutions deliver concrete, demonstrated value to the financial and insurance sectors by strengthening risk management, enhancing data accuracy, and catalysing new business models such as parametric insurance.

Satellite Earth Observation (SatEO)

SatEO is actively transforming risk assessment and claims management in a wide range of sectors. European Earth observation capabilities draw upon a diverse range of datasets, including those from the Copernicus Sentinel missions (e.g. Sentinel-1 radar, Sentinel-2 optical imagery, Sentinel-3 ocean and land observations, Sentinel-5P atmospheric monitoring and Sentinel-6 sea-level measurements), and ECMWF climate products, such as ERA5, which delivers trusted, frequently updated and globally consistent information for insurance, finance and or finance and insurance applications.

For example, in agricultural insurance, combinations of optical and radar data provide risk managers and claim adjusters with real-time crop yield forecasts and pre-harvest loss estimates down to individual farm plot scale. Satellite-derived indices enable parametric micro-insurance for farmers to trigger automated payouts, eliminating costly and complex on-site claims handling.

In commercial property, the fusion of SatEO data with artificial intelligence delivers rapid and highly accurate property valuations, reducing traditional assessment times and directly addressing the industry-wide financial risk of underinsurance.

Copernicus data, supported by globally historical climate datasets like ERA5, can help insurers manage natural catastrophe risks and for pre- and post-event analysis, such as flood and earthquake damage verification. Combining optical data with other datasets can generate highly accurate and frequently updated coastal Digital Elevation Models

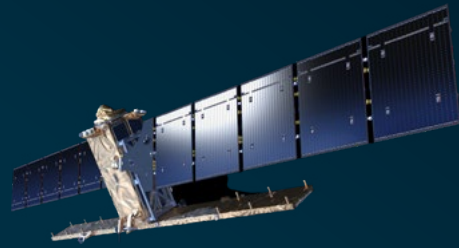


Image: Copernicus Sentinel-1. Credit: ESA/ATG medialab

which drastically improve storm-surge predictions or coastal exposure assessments, and even quantify the protective capacity of natural flood defences. They can be supported by ocean and coastal data, with sea surface temperature and sea-level rise observations. High-resolution satellite imagery and DEMs are also used to recommend property-specific Nature-Based Solutions for flood mitigation measures, such as terrain characteristics for vegetation establishment, effectively reducing rebuilding expenses for insurers.

SatEO also provides critical transparency and impact verification for the broader financial sector. Asset managers and investment funds utilise continuous, satellite-derived environmental risk monitoring to evaluate supply chain risks and ensure sustainable investment decisions, such as tracking deforestation linked to soft commodities in real-time to prevent financial or reputational losses. For ESG compliance and decarbonisation efforts, combined SatEO technologies can detect and quantify greenhouse gas super-emitters in the energy sector, reducing emissions data gathering times to near-real-time weekly cadences. Optical data is also used to monitor biological carbon sequestration and land-cover changes, enabling verification of carbon stocks and fluxes.



Image: Galileo (Credit: ESA-P. Carril Wikimedia Commons/G. Porter)



Satellite Communications (Satcom) and Positioning, Navigation and Timing (PNT)

Satcom and PNT systems provide the critical infrastructure for secure financial operations and telematic insurance. Galileo, one of the world's most accurate civilian satellite navigation systems, synchronises high-frequency financial transactions and supports telematics-based tariffs and claims verification by tracking insured goods and policyholder activity. For example, enhanced high-frequency GNSS data allows insurers to instantly detect severe vehicle crashes and eliminate false positives without relying solely on driver phone calls. Satcom also plays an important role in transmitting data and facilitating remote payments, including microfinance and banking services in unconnected and under-served regions. ESA supports public-private partnerships and co-funds the development of advanced Satcom technologies for innovative communications solutions: solutions for space which also benefit European industry. Enhanced secure connectivity, cyber resilience and ubiquitous communications capabilities support business continuity, disaster response and the operation of digital services that increasingly underpin risk management, insurance operations and financial decision-making.

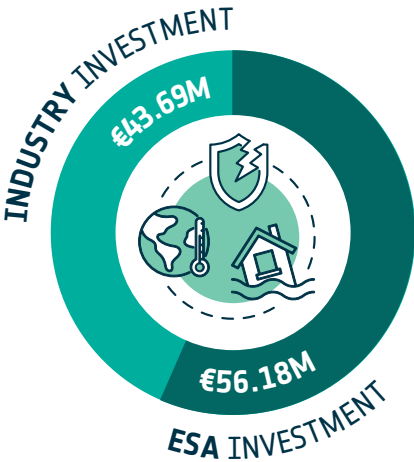
Future Missions

Finally, whilst current space assets already deliver significant commercial value, upcoming missions planned for launch from 2026 onwards, will further enhance capabilities relevant to the finance and insurance sectors. Missions such as ESA's Fluorescence Explorer (FLEX) and the Sentinel Expansion Missions (including CO2M for carbon monitoring, LSTM for land surface temperature, and CRISTAL for polar monitoring) will provide high-precision climate and resource data supporting further refinement of ESG reporting and climate risk assessment models. Beyond Earth observation, Europe's IRIS² secure connectivity constellation will strengthen communications infrastructure through a multi-orbit architecture designed to serve government, commercial and critical sectors, including transport and remote communities. By enhancing resilience, digital sovereignty and secure connectivity capabilities, IRIS² is expected to create new opportunities for data-driven services and improve the reliability of applications that depend on continuous, secure access to space-based information.

Image right: Part of the icy landscape of the [Northeast Greenland National Park](#), captured by the Copernicus Sentinel-2 mission. Credit: contains modified Copernicus Sentinel data (2024), processed by ESA

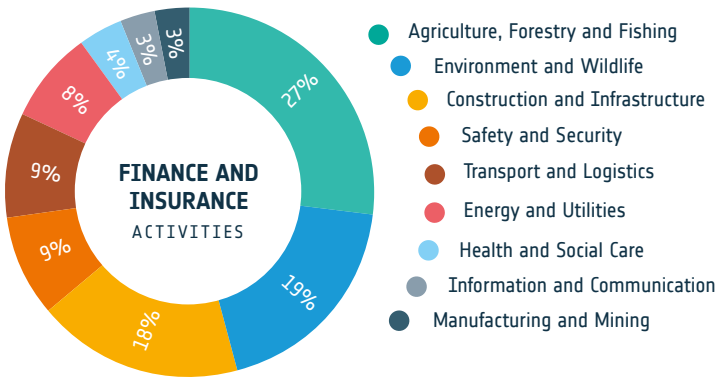
PORTFOLIO ANALYSIS

Since the inception of ESA BASS in 2010, a total of 141 contracts in Finance and Insurance (F&I) have been signed in nearly all Member States subscribing to the programme, including 78 Feasibility Studies and 63 Demonstration Projects. Activities have more than doubled between 2022 and 2025, reflecting a sharp acceleration in recent years.



Finance and insurance are central to the evolving economy and by directing investment flows and managing risk, they influence real-world activities. They drive transformation across a wide range of interconnected sectors with their influence extending beyond financial institutions.

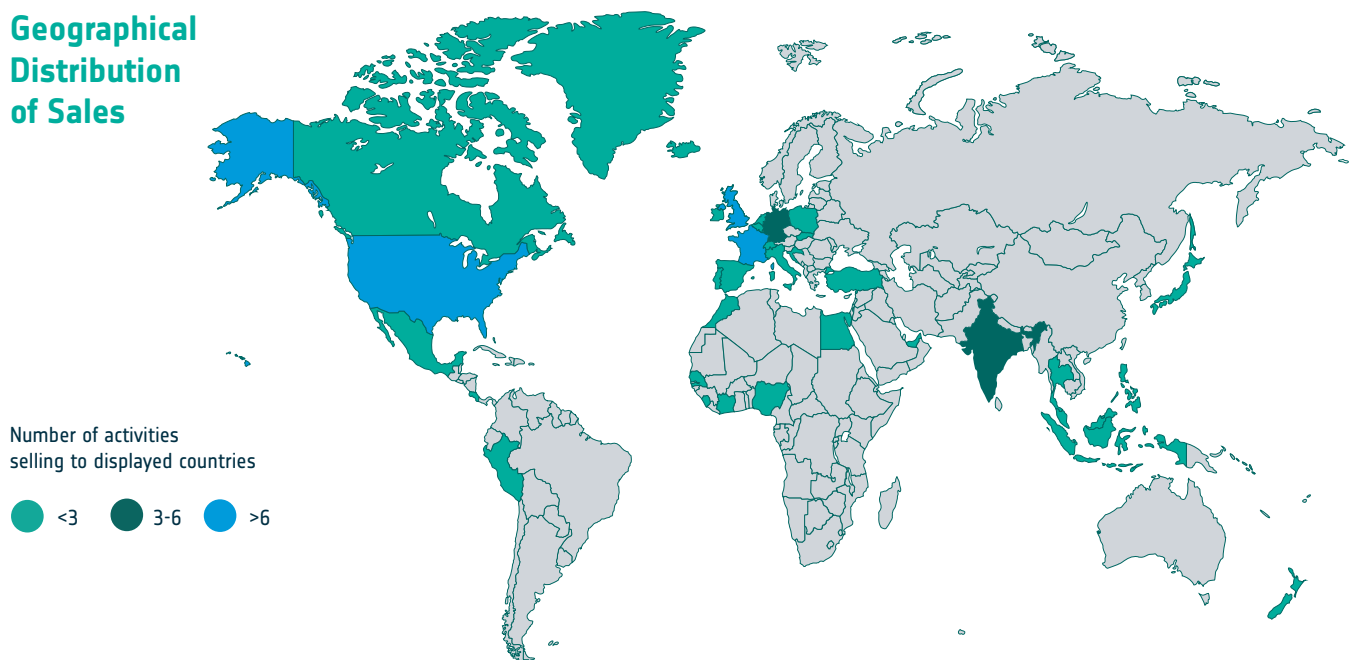
The piechart below highlights the breadth of sectors supported in the F&I activities within BASS, as well as the main thematic areas where these services are driving impact and transformation.



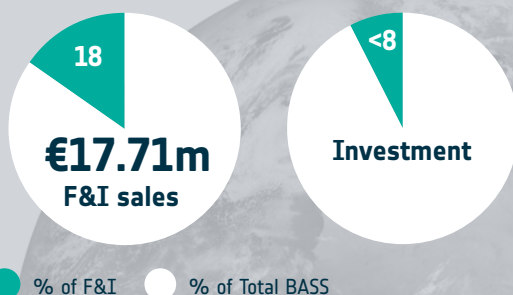


Nearly **two-thirds** of all F&I Demonstration Projects reported **positive socioeconomic impacts**, including sales, jobs, and establishing business partnerships, and nearly **three-quarters** generated sales, outperforming the overall BASS portfolio.

Geographical Distribution of Sales



F&I demonstration projects achieved €17.71m in sales, nearly 18% of total BASS sales yet less than 8% of overall BASS investment (ESA price). Significantly, a quarter of sales were secured outside Europe, demonstrating the potential of BASS-supported activities within Europe and beyond.



Across global markets, the 63 F&I demonstration projects collectively achieved:

255 new jobs

232 partnerships globally

and **17.71** MEUR sales

FLAGSHIP ACTIVITIES

Scalable Earth Blox (UK)



Scalable Earth Blox (UK) has deployed a fully scalable, low-touch Software as a Service platform that enables non-coders to build customised geospatial and Earth Observation analytics in the cloud. The platform provides access to more than 900 satellite-derived datasets – including Sentinel-1, -2, -3 and -5P – updated within 24 hours and supported by Google's cloud-scale processing power. The service is accessible to users without geospatial expertise and is used by data analysts across multiple sectors in applications such as deforestation monitoring, supply-chain risk assessment and environmental compliance.

Impact/achievements: The team achieved commercial rollout during the project phase and attracted a growing user base. The platform has broadened access to European EO data, accelerating adoption across environmental consultants, financial services, and sustainability-focused organisations. Alongside ESA funding, Earth Blox has advanced commercially, collaborating with Lloyds Banking Group and securing substantial private investment, including £6 million led by PXN Ventures. This confirms the company's growing impact in supporting institutions navigate climate and nature-related risks.

IBISA (LU)



IBISA (LU) has developed an end to end, index based climate insurance service that protects smallholder farmers in developing countries against weather related risks. They use satellite data such as Sentinel-2 and ECMWF, in situ measurements and bespoke risk modelling software to create accurate, transparent and affordable insurance policies. The service removes the need for traditional physical loss assessments by monitoring key parameters such as rainfall, wind and temperature.

Impact/achievements: IBISA tested the solution in India, the Philippines and Senegal, securing contracts with all pilot users and attracting additional clients. The company expanded coverage to 77 new districts and provided insurance services to over 200,000 policyholders across three countries. The service enhances climate resilience, strengthens farmers' financial stability and continues to scale.

Sat4Insure (FR)



Sat4Insur (FR) is a service designed to support agricultural insurers with near real time estimates of crop losses, yield forecasts, yield volatility and planted areas. The decision tool helps risk managers and claim adjusters assess weather-related financial losses, enabling assessment of portfolio exposure. The system uses Earth Observation data from Sentinel 1 and Sentinel 2 satellites, supplemented by daily meteorological data from Copernicus, and operates across five spatial scales, from farm plot to administrative region, updating information every two weeks.

Impact/achievements: The company secured a contract with the pilot user, Abeille Assurances. The solution is now recognised as a valuable operational tool among insurers and stakeholders, particularly the crop insurance market, and it is intended to broaden capabilities to include extreme weather event analysis.



BirdsEyeView's RAPTOR™ (UK)



BirdsEyeView's RAPTOR™ (UK) provides algorithmic underwriting and natural catastrophe modelling for the event insurance market. This online tool reduces the cost of handling low-premium business by enabling brokers to quote, place and bind smaller event risks in under a minute through fully automated workflows. By integrating ERA5 reanalysis data, their WEATHER ANALYTIX™ delivers accurate, location-specific weather analytics that quantify exposure to extreme weather and NatCat hazards meaning underwriters benefit from robust, data-driven insights that support accurate pricing of larger outdoor events.

Impact/achievements: BirdsEyeView has established pilot partners, achieved usage across the UK, EU, US, Australia and Canada, and live commercial deployment with paying customers. The company is now building on its weather and NatCat modelling capabilities and advancing business development for wildfire applications, making it a strong candidate for BASS growth projects.

PARTNERSHIPS

Partnerships are a cornerstone of ESA BASS, bringing critical insight into market needs and challenges, access to expertise, real-world use cases, pilot opportunities and a direct pathway to market for applicants.



Liberty Mutual Reinsurance (LM Re), the treaty reinsurance business of global insurer Liberty Mutual Insurance Group, operates through five underwriting platforms, including a regional focus in Europe. The Paris office has a dedicated data science team with advanced expertise in global parametric and agricultural solutions, promising focus domains for ESA BASS. LM Re is a potential end user of space-enabled services and plays a key role in articulating market needs and supporting the uptake of solutions developed under the programme.

In January 2026, a Memorandum of Intent formalised their collaboration and aim to explore the application of space-enabled parametric insurance, particularly in agriculture and forestry. This resulted in a joint workshop on forest wind damage in February 2026, Following a joint workshop on forest wind damage in February 2026, where specific use cases were outlined, LM selected their preferred solution. Subsequently, the company secured a cooperative agreement with ESA BASS, with LM Re as their champion user. Further joint initiatives are planned, demonstrating the value of this collaboration in bridging innovation with market application.

The **UK Centre for Greening Finance and Investment (CGFI)** was a programme established in 2021 by UK Research & Innovation (UKRI) via the Natural Environment Research Council (NERC) and Innovate UK, ending in 2025. CGFI linked scientific research with finance, supporting the use of climate and environmental data by financial institutions. In 2022, ESA and CGFI signed a Memorandum of Intent and this strategic collaboration led to the launch of the

'Finance for a Green Transition' funding call, designed to unlock the potential of space-based solutions in supporting sustainable finance and addressing key environmental challenges.

Aon plc, a global leader in risk management and reinsurance, played a strategic role in supporting the 'Coastal Resilience' call. Aon brought market driven insight and contributed to defining priority areas which ensured strong alignment with industry needs and facilitated pathways to market, evidenced by Aon supporting one of the proposals as prospective customers. Further opportunities are being explored, including the application of nature-based solutions in forestry and agriculture, reinforcing this partnership's value in driving innovation and uptake of space-enabled services.

Insurtech Gateway is a London and Sydney-based venture capital firm specialising in supporting risk and insurtech startups through launch, regulation, funding, and access to its established insurer network. This pathway to commercialisation is strengthened by its FCA regulated launch capability ability, and Lloyd's Coverholder. In collaboration with ESA, two of Insurtech Gateway's portfolio companies expressed interest in using space-based data and two contracts are now in development. This has created a valuable pipeline of prospective opportunities, demonstrating how this partnership is accelerating the development, scaling, and market entry of space-enabled insurance solutions.

CONCLUSION AND WAY FORWARD

Finance and insurance have become a strategic, cross-cutting domain within ESA BASS, with a growing portfolio of activities that both address sector-specific challenges and support innovation across other sectors. Projects spanning areas such as blue finance, nature-based solutions, coastal resilience and wildfire risk, demonstrate the breadth of applications of finance and insurance mechanisms across the wider economy. Space-based capabilities are playing an increasingly important role in financial and insurance services, improving risk assessment, forecasting and long-term resilience. To accelerate these opportunities, BASS has launched several dedicated initiatives, including Insurance Technology and Green Finance, and established a dedicated working group to stimulate innovation and market adoption.

Collaboration with leading market actors has been instrumental in ensuring that activities address real-world challenges and have credible pathways to market adoption. The strong socio-economic impacts achieved to date demonstrates the importance of this domain as a key investment area for the programme, and further initiatives are planned to expand its reach and impact.

Current activities focus on improving the understanding and management of natural catastrophe risks and their implications for insurers, asset managers and the wider economy, while exploring how space based capabilities can support both mitigation and adaptation strategies. Future work will expand towards business continuity and resilience challenges, including supply chain and trade disruption, geopolitical risk monitoring, and the growing need for actionable business intelligence in an increasingly interconnected and uncertain global environment. By bringing together end users and industry to validate solutions in operational settings, ESA BASS helps bridge the gap between technological capability and market adoption. This support reduces barriers to innovation, accelerates uptake of space-enabled services, and helps ensure that investments in space infrastructure deliver tangible benefits across the wider economy.



ACTIVITIES ROADMAP

● CALLS ● TOPICS OF INTEREST





Scan the code for
more information

ACCESS	Accelerating Commercialisation and Competitiveness of the European Space Sector
BASS	Business Applications and Space Solutions
EO	Earth Observation
ESA	European Space Agency
F&I	Finance and Insurance
GNSS	Global Navigation Satellite System
LEO	Low Earth Orbit
PNT	Positioning, Navigation and Timing
SatEO	Satellite Earth Observation
Satcom	Satellite communications
SME	Small and Medium Enterprise

