CLIMATE
SERVICES

INTRODUCTION

Satellite-derived Earth Observation (EO) data improves the global understanding of our changing climate and the risks that climate change poses to our daily lives and businesses. There is a demand for EO data to provide information and assessments to support regulatory compliance, meet NetZero targets and achieve sustainability goals.

Quality assured EO and climate data are essential for trustworthy climate-related risk assessments, disclosures and Environmental Social Governance (ESG) reporting. Geospatial analysis of EO-derived parameters can also provide the evidence required for regulated land management and environmental compliance.

A number of EO-enabled tools now exist to support Climate Services, such as Climate Risk Index from Space Platforms (CRISP) and Financial and Earth Observation (FinEO).

CRISP
Climate Risk Indices from Space Platforms

Fin€O

CLIMATE RISK INDEX FROM SPACE PLATFORMS (CRISP)

Telespazio UK and Assimila work with the green finance sector to understand how the UK space industry can support and provide tools for climate-informed decisions and disclosures.

Engagement with the finance sector highlighted an interest in climate data that focuses on extreme climate conditions, such as temperature extremes, heavy precipitation, drought, wind speed and sea level. These datasets are useful for the finance sector to better understand climate risk, i.e. the physical risks of climate change on particular areas or assets of interest. To help address this, Telespazio UK and Assimila have generated a **climate risk index** that provides this information in a user-friendly format.

WHAT IS THE CRISP TOOL?

CRISP brings together quality assured satellite EO, historical reanalysis and climate projection datasets to generate a range of climate indices related to:

> **Extreme High Temperatures**
> **Extreme Low Temperatures**
> **Extreme Precipitation**
> **Drought**
> **Extreme High Wind**
> **Sea Level Rise**

We combine different climate indices to produce an Actuarial Climate Index (ACI). The ACI quantifies the frequency of extreme events on a monthly basis for a location of interest. This ACI information, when combined with vulnerability and exposure information, can then generate a climate risk index for a particular area of interest. An intuitive interface provides access to the climate indices and the ACI, showing spatial distribution and timeseries of indices for the location of interest. Use cases, where a climate risk index has been developed for an area of interest, are demonstrated on a web-based interface to show companies how to use this data in their own assessments of climate risk.
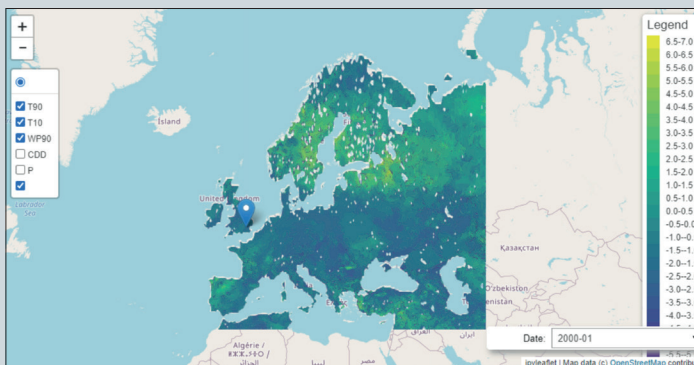
CRISP tool interface where the climate indices are displayed over Europe for a selected month.
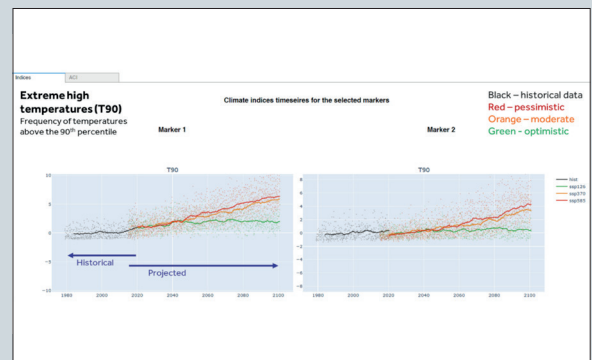
Example of historical and projected T90 index for Madrid (Marker 1) and Glasgow (Marker 2).

THE NEED FOR CRISP

CRISP provides access to quality assured, world-leading climate data to help address the challenges associated with our changing climate and extreme weather events. It provides critical information needed by companies to perform climate-related risk assessments associated with their operations and assets, and will help inform mitigation and adaptation actions they need to take.

From April 2022, the UK government announced mandatory TCFD-aligned (Taskforce on Climate-related Financial Disclosures) requirements for large companies and financial institutions, with this extending to companies across the economy by 2025. Aside from national regulations, large companies are increasingly obliged to assess and report on their climate-related risks so that these can feed into stock prices and decision-making. Companies are increasingly interested in monitoring and assessing their physical climate risks, i.e. risks to a company's own physical infrastructure or operations from flooding, wild fires, sea level rise and storm surges etc. so as to identify appropriate mitigation strategies. Additionally, customers and investors are becoming increasingly 'climate aware' and are demanding higher accountability from companies. Climate Risk Disclosure (CRD) is picking up

pace and there is a significant opportunity for satellite data in supporting climate-related financial disclosures. It is anticipated that within the next few years, geospatial data will be deeply embedded in financial and risk analysis assessment across multiple industries.

NEXT STEPS

The CRISP tool is continuing to develop and the team now wants to engage with consultants, intermediaries and in-house teams within financial organisations and institutions for the next phase of development whilst there is still flexibility to influence further development. Through working with potential stakeholders, we aim to develop the tool and use cases specific for their needs. If you are interested in finding out more, contact the team at CRISP@telespazio.com.

FINANCE AND EARTH OBSERVATION (FINEO)

In recent years, the move towards sustainable finance has increased, yet there remains a shortfall on clear and consistent environmental, social and governance (ESG) data. Historically the main source of company-level ESG data has been provided by the companies themselves. Sourcing self-reported data from companies has created issues around reliability, bias, accuracy and coverage. The emergence of 'Spatial Finance' offers solutions enabling us to move away from the dependency on voluntary company reporting, by assessing company's actions using a geospatial approach. Spatial finance can complement existing approaches by using previously uncaptured data to provide more frequent and detailed insights on climate and environmental risks from both environmental and anthropogenic impacts.

Telespazio UK has over 40 years of experience in space services and operations and is a leader in the field of Earth Observation, making it a natural fit to extend our expertise into the spatial finance sector, working alongside financial institutes who play an integral part in regulating global industrial activities to protect our society.

WHAT IS THE FINEO TOOL?

FinEO is a satellite-based artificial intelligence (AI) spatio-temporal tool that ingests (i) satellite imagery from different sensors, (ii) datasets associated with specific industry activities and (iii) environmental conservation datasets. The tool provides metrics and granular monitoring of changes in the environment (land and water) that can be associated to industry activities addressing natural capital deterioration and/or restoration for environmental risk assessment and disclosures validation.

THE NEED FOR FINEO

FinEO uses a multivariable environmental impact score to produce a multidimensional (space and time) environmental risk score for any asset across industry by using an AI technique. FinEO is a novel standalone solution using machine learning to address the challenge of sector, site location and use case specific products through analyses of mid to high-resolution satellite data. Combining it with complementary in-situ, company classified data and/or open-source data will make it an even more powerful environmental risk tool to have in every financial institute's toolset.

FinEO fills the technical gap between industry reporting and the incomplete, fragmented and often non-validated environmental data provided by data aggregators and used by financial institutions. It enriches the decision-making criteria with data that is transparent and geospatially validated to feed current environmental key performance indicators (KPIs) from international and established frameworks for environmental risk assessment.

FinEO Demonstrator - Forest environmental impact index (sector: mining)