



Webinar

Natural Capital Kick-Start

Mina Syriou | [European Space Agency](#)

Guest Speakers:

- Claire Wansbury | [Atkins Limited](#)
- Christophe Christiaen | [Spatial Finance Initiative, University of Oxford](#)



Webinar's host



Mina Syriou
Business Applications & Partnerships
ESA Business Applications – Space Solutions

Agenda

1. Introduction
2. ESA Space Solutions
3. Kick-Start Programme
4. 'Natural Capital' Kick-Start
5. Our guest speakers
 - Claire Wansbury - Atkins Limited
 - Christophe Christiaen - Spatial Finance Initiative, University of Oxford
6. How to Apply
7. Q&A

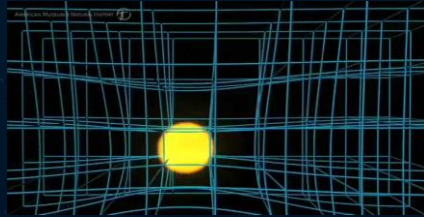
A glass jar filled with coins, with a small green plant growing out of the top. A tag attached to the jar reads "CAPITAL". Stacks of coins are on the surface next to the jar. The background is a blurred green field.

ESA's 4 Main Pillars



SPACE SOLUTIONS

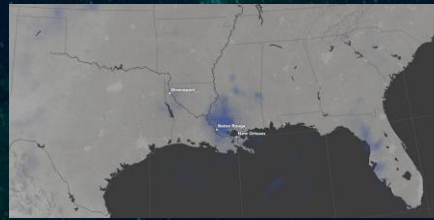
Science and Exploration



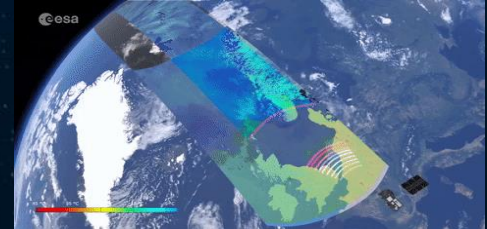
Enabling and Support



Safety and Security



Applications



The largest space innovation network in the world

- The **go-to** place for great business involving space to improve everyday life.
- Supporting European start-ups and SMEs to develop businesses **using space technology and data**.
- Offering **funding, business and technical support** to help to generate successful business and create jobs.



ESA SPACE SOLUTIONS offers



Zero-equity funding (from
€50k to €2M+ per activity)



A personalised ESA
consultant



Technical support and
commercial guidance



Tailored project
management support



Access to our international
network of ESA and partners



Access to our network
of investors



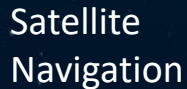
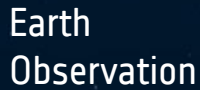
Credibility of the
ESA brand

Project web pages:

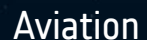
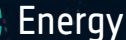
business.esa.int/projects



... to serve Users & Market



5G (<https://artes.esa.int/esa-5g6g-hub>)



Kick-Start: Background

6 months duration -
Overall cost €80K

€60K ESA funding
[75% ESA co-funding]

“Kick-Start Activities” are ESA’s funding scheme enabling companies to undertake short Feasibility Studies that explore new service and application concepts making use of space capabilities

- Limited initial investment by companies, particularly attractive for SMEs and start-ups, granting them an easy entry into ESA Business Applications
- Semi-competitive tendering procedure
- Rapid evaluation process, to allow companies to keep the pace in the market
- If successful, possible follow-up support via Demonstration Projects

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Kick-Start: Goals

Kick-Starts looks at 3 main elements:

1. Engagement with potential end users and customers to understand their needs and translate these into service requirements.
2. Evaluation of the technical feasibility of the service, and definition of the service and system architecture.
3. Evaluation of the economic viability of the service and development of a business plan.



NATURAL CAPITAL

Now Open

SUBMIT YOUR PROPOSAL

OPPORTUNITY Intended Tender

ACTIVITY Kick-start Activity

OPENING DATE 19 September 2022

CLOSING DATE 11 November 2022



Topics

- Nature based interventions – land use change
 - Sustainable forest management - Managing+ and increasing tree cover
 - Managing and monitoring soil carbon
 - Improving wildlife/ biodiversity
- Nature based interventions – water and marine environment
 - Managing freshwater and wetlands
 - Managing the marine environment



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The value of space

Satellite Communication (SatCom)



Can provide **connectivity to remote areas** with limited or no terrestrial connectivity (wired or wireless), where especially most carbon storage sites, and reforestation/ land restoration actions will be located. This connectivity can be used for instance to remotely monitor local energy production and geological sensor status to explore renewable energy resources, achieve sustainability and provide in-the-field team with access to needed on-line services.

Satellite Earth Observation (SatEO)



Can be used for water management and drought monitoring on farms, landscape protection, tracking changes in plant species diversity and using remote sensing to infer species richness. Map land cover disturbance from fire, insect infestation, drought or resource development.

Global Navigation Satellite Systems (GNSS)



Can be used for **locating and geo-referencing new sites of deployment** and for supporting local teams in the implementation of the planned afforestation/ reforestation/ restoration actions. GNSS can be used to provide **geo-/time-referenced sensor information** from deployed Internet of Things (IoT) systems. Furthermore, GNSS can be used to support geophysical and hydrographic surveys and to support autonomous marine systems used to monitor bodies of water while reducing the associated carbon footprint.

Guest speaker #1

Claire Wansbury

Fellow and Technical Authority on
Biodiversity and Natural Capital, Associate
Director of Ecology at ATKINS





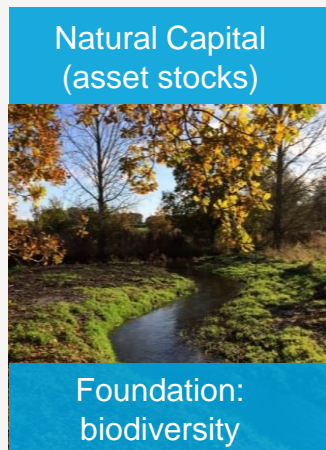
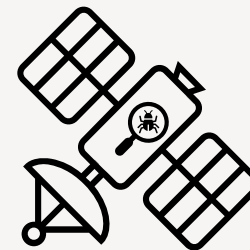
ATKINS
Member of the SNC-Lavalin Group

Natural Capital and the European Space Agency: Why we need space science to enable a nature-positive future

Claire Wansbury, Atkins Fellow and Associate Director of Ecology



What is 'Natural Capital'?



We are supported by natural capital and we can affect it positively and negatively.

Natural Capital protocol: decision-making framework guiding organisations to identify, measure and value direct and indirect impacts and dependencies on natural capital.



What is Biodiversity?

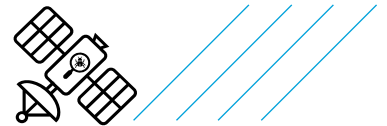
The **variety of life** on earth ecosystems, habitats and species.

A scientific term, also used to refer to nature or nature conservation, including wildlife's value to people.

Biodiversity is a key part of our natural capital, underpinning delivery of many ecosystem services.

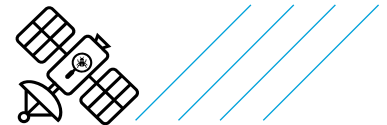
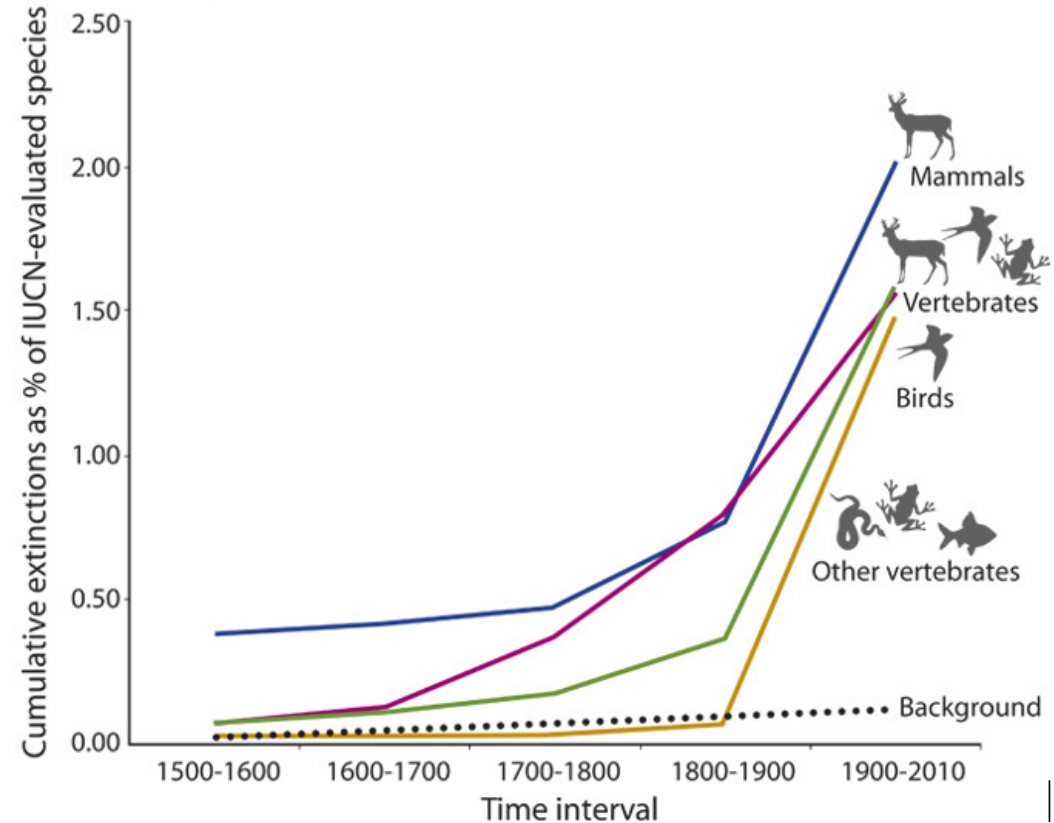


Photo credit London Wildlife Trust



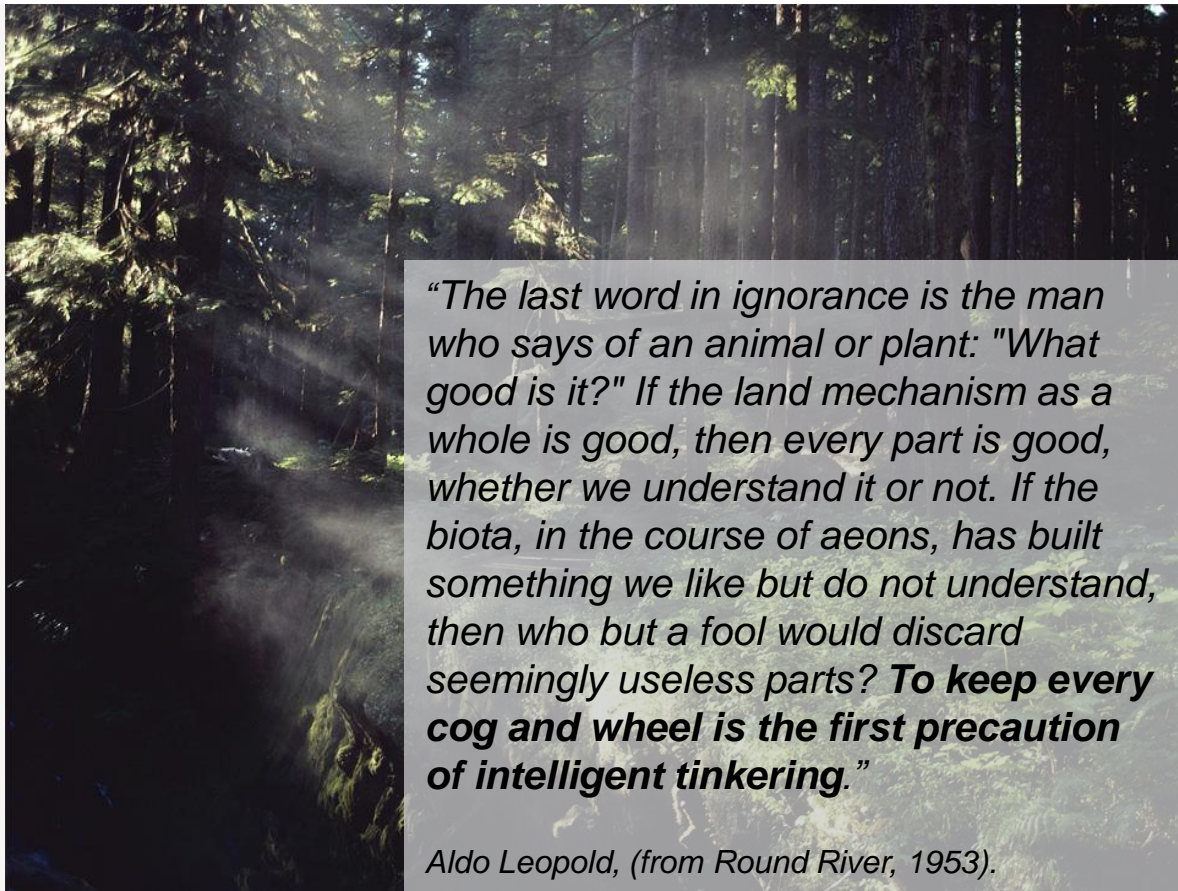
Biodiversity loss

- Five prehistoric 'Extinction Events'
 - *Fifth = Cretaceous – Tertiary extinction, death of the dinosaurs*
- Sixth Extinction Event
 - *First to be caused by a single species*
 - *Estimated rate of extinction 100 – 1,000 times higher than natural background extinction rate*



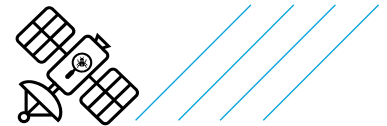
Natural Capital – putting a price on nature?

- Natural Capital discussions sometimes involve monetized figures that help evidence value of the benefits of nature
- Talking about monetizable elements of natural ‘capital’ doesn’t mean we can’t use other ways of articulating value, such as rareness



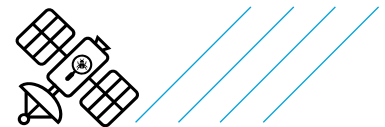
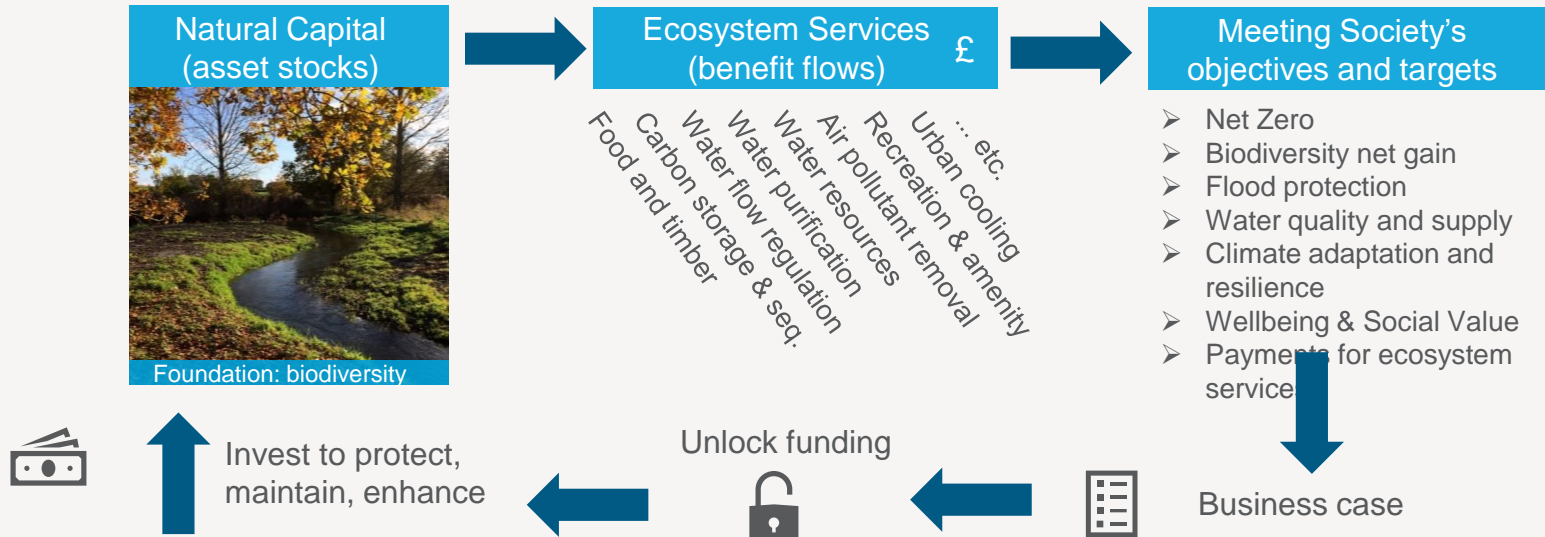
*“The last word in ignorance is the man who says of an animal or plant: “What good is it?” If the land mechanism as a whole is good, then every part is good, whether we understand it or not. If the biota, in the course of aeons, has built something we like but do not understand, then who but a fool would discard seemingly useless parts? **To keep every cog and wheel is the first precaution of intelligent tinkering.**”*

Aldo Leopold, (from Round River, 1953).

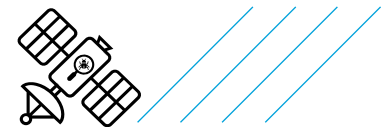
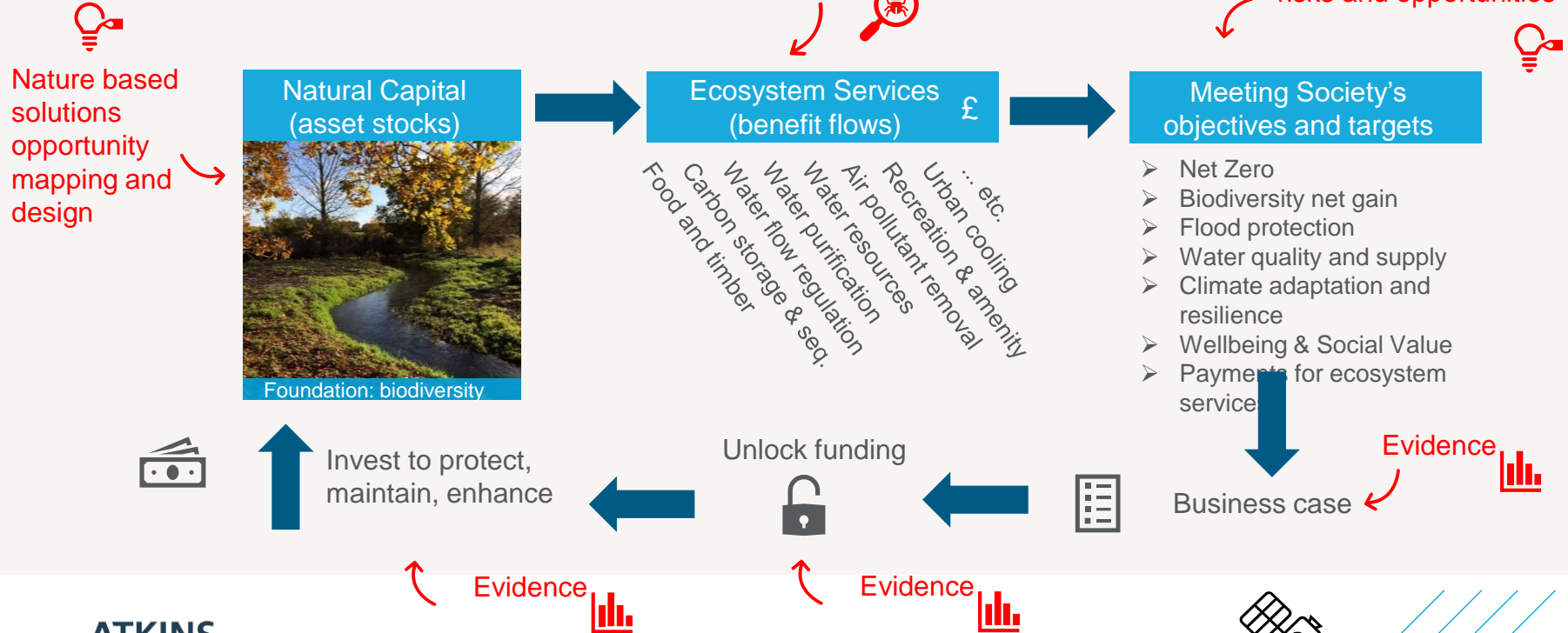


How does 'Natural Capital' benefit us, and how can understanding and valuing Natural Capital benefit nature?

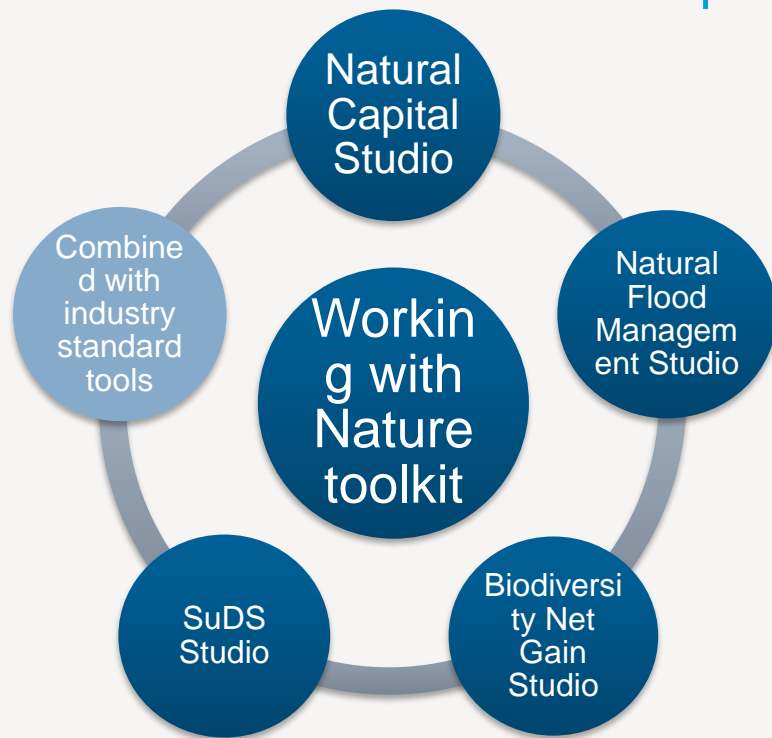
Ecosystem services are provided for free, so are traditionally not values in cost / benefit decisions



Why do we need data?

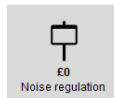


How can we use data? Example - Atkins' 'Working With Nature' Toolkit

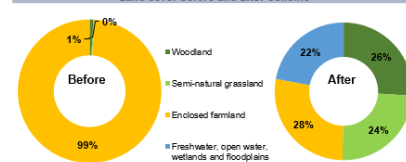


Natural capital valuation

ATKINS
Member of the SNC Lavalin Group
Catchment | Digital Analytics



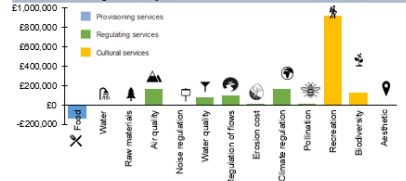
Land cover before and after scheme



Annual ecosystem services value before and after scheme

	Before scheme	After scheme
Provisioning services		
Food	£182,776	£44,834
Water	£0	£0
Raw materials	£0	£0
Regulating services		
Air quality regulation	-£30,977	£132,556
Noise regulation	£0	£0
Water quality	-£15,360	£65,870
Regulation of flows	£1,012	£37,542
Erosion costs	-£11,854	-£2,525
Climate regulation	-£60,941	£98,935
Pollination	£214	£6,952
Cultural services		
Recreation	£123,609	£1,042,258
Biodiversity	£3,383	£125,743
Aesthetic	£0	£0

Change in ecosystem services after scheme - annual



Data makes a difference - Spains Hall Estate, Essex

Challenge: quantify the benefits of land management changes inc. agroforestry, Natural Flood Management and beaver release to explore potential for new funding sources.

Approach: Atkins used Natural Capital Studio to make a “before and after” comparison based on opensource, site survey and monitoring data.

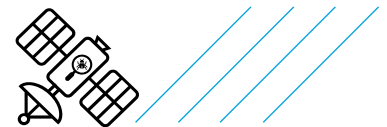
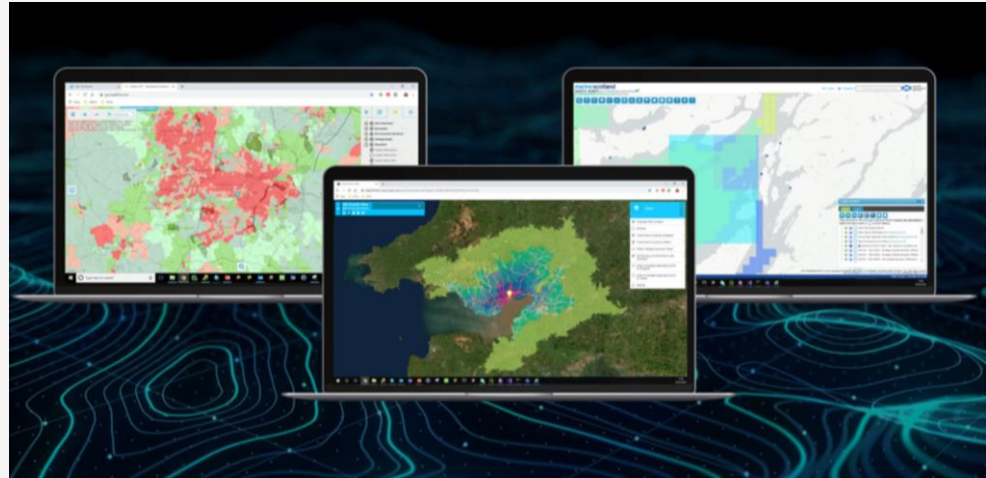
Outcome: evidence informed successful application to take part in biodiversity and carbon credit trials, and supported the business case for the estate’s switch from a “food first” to “nature first” model.

Data made a difference: revenue generation opportunities relating to biodiversity and payments for other ecosystem services.



How can Space Data and Technology help protect and restore natural capital?

- Habitat locations and types
- Habitat condition
- Species' abundance and movement
- Water flows
- Pollution
- Interactions between people and nature
- Real time monitoring
- ...
- The limit is your imagination, not mine!



Any Questions?

Claire Wansbury FCIEEM FLS CEcol CEnv CMLI

Atkins Fellow and Associate Director

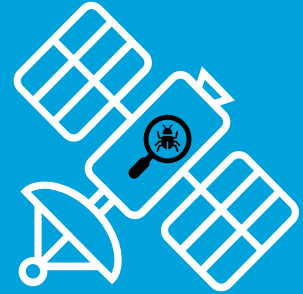
Find me on LinkedIn – search for Claire Wansbury

Or Twitter - @Ecologytweets



Atkins' Interactive PDF: https://www.snclavalin.com/~media/Files/S/SNC-Lavalin/download-centre/en/brochure/valuing_our_natural_capital.pdf

David Attenborough [Why is biodiversity important - with Sir David Attenborough | The Royal Society - YouTube](#)



Guest speaker #2

Christophe Christiaen

Innovation and Impact Lead at Spatial
Finance Initiative, University of Oxford



GREEN FINANCE & NATURAL CAPITAL

COMMERCIAL OPPORTUNITIES
FOR SPACE-BASED SOLUTIONS

Christophe Christiaen
7th September 2022

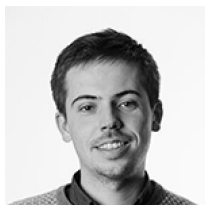
OXFORD SUSTAINABLE FINANCE GROUP

Research themes

- Climate and Environmental Analytics
- Machine Learning & Data Science
- Spatial Finance
- Stranded Assets and Transition Finance
- Future of Engagement

Specific initiatives

- Centre for Greening Finance and Investment
 - Spatial Finance Initiative
- Commonwealth Climate and Law Initiative
- Public and Third Sector Academy for Sustainable Finance
- Sectoral Data Quality and Integrity project



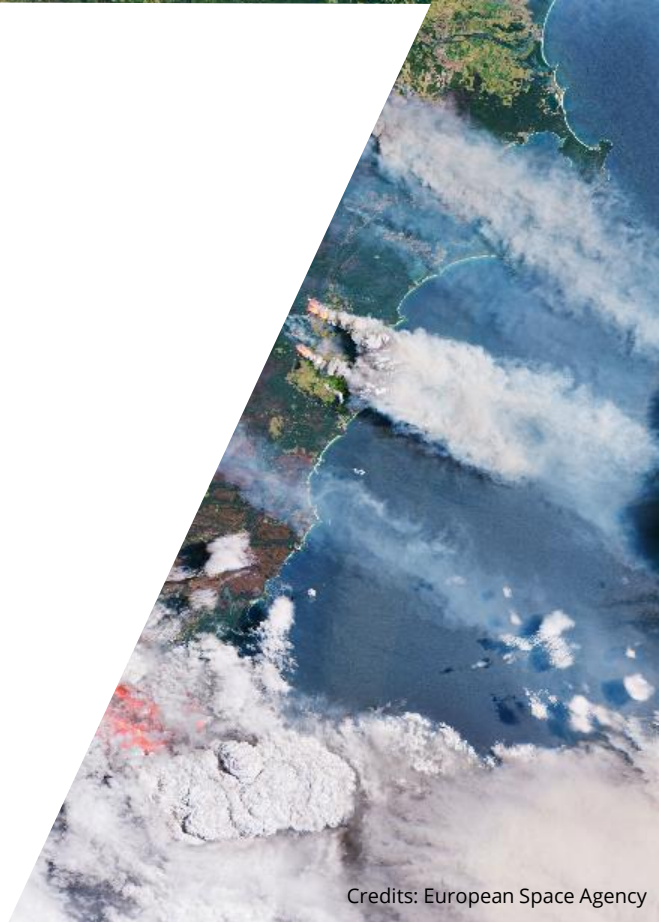
MARKET DEVELOPMENTS

Green/Sustainable Finance is about:

- Aligning the financial system with global sustainability = Greening Finance
- Financing the transition to global sustainability = Financing Green

Interest in green finance is growing rapidly, driven by:

- **Financial considerations**
- **Regulation and policy**
- **Customer and consumer preferences**



Credits: European Space Agency

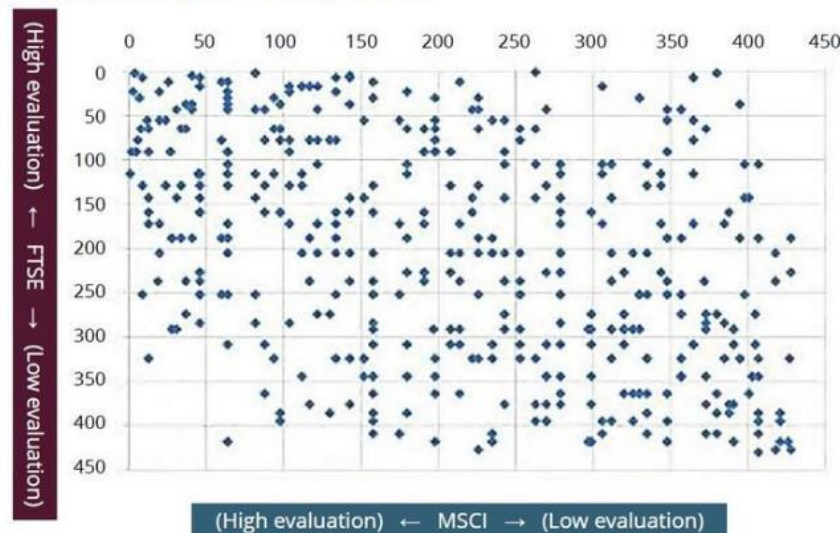
DATA CHALLENGES

Main source of data on a company's sustainability performance is its voluntarily reported information or 'disclosures'.

This comes with various challenges:

- Information is **self-disclosed** and typically compiled top-down
- ESG reporting is not mandatory, which means **not all companies report**
- ESG reporting not standardised, which means **data is not comparable**
- Annual reporting means ESG **data is outdated** once released

Figure 1 – Comparison of ESG scores from FTSE



Source: CLSA, GPIF

RELEVANCE OF GEOSPATIAL SOLUTIONS

Spatial finance allows for a **bottom-up** understanding of **risks, opportunities and impacts**, driven by

- **Neutral** and objective source of information
- **Consistent** and **frequent** data collection
- **Global** datasets allow for **comparison** over time and place
- Connecting financial system with real economy

We are seeing an increasing uptake of spatial finance approaches and analytics, driven by

- Climate-related financial risk assessment and disclosure
- Nature-related financial risks and impact assessment
- Investor engagement campaigns on sectoral ESG issues



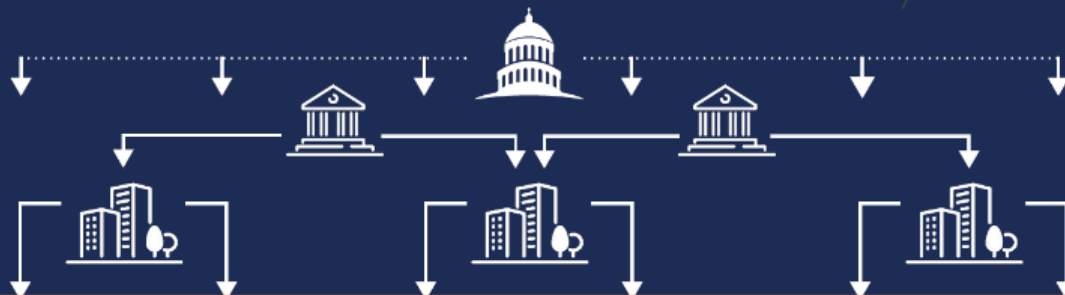
Source: European Space Agency

SPATIAL FINANCE AND ASSET-LEVEL DATA

GOVERNMENTS
regulate and create
policies across all
sectors

INVESTORS own
companies

COMPANIES own
exposed assets



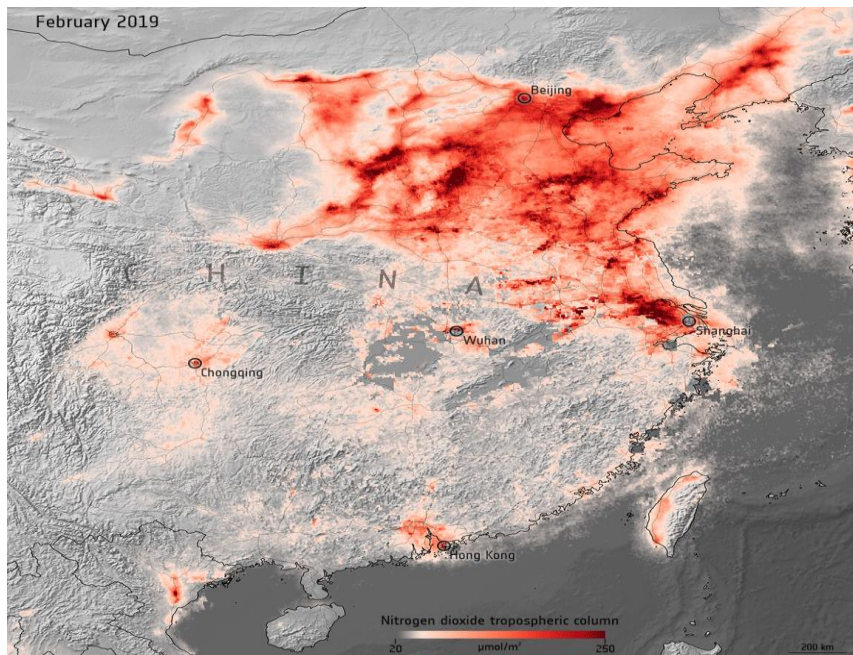
OBSERVATIONAL DATA
E.g. GHG emissions, climate
hazard, air pollution



ASSET DATA
E.g. location, ownership,
production type, capacity, age

ASSETS, both
built and natural,
are exposed to
different climate
risks, impacts and
opportunities

OBSERVATIONAL DATA



Nitrogen dioxide emissions over China
Credits: ESA



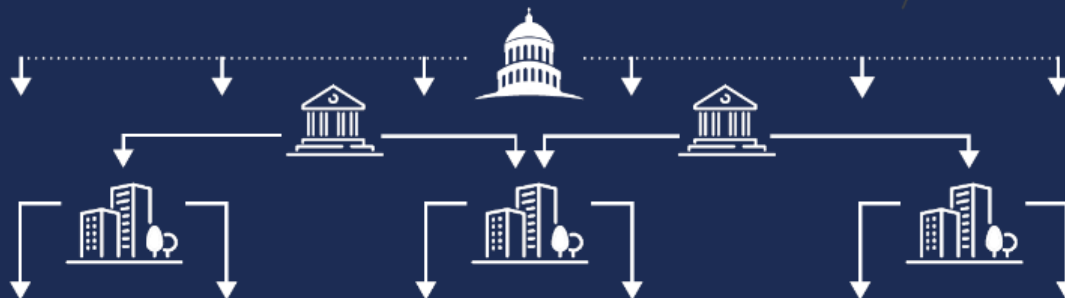
Deforestation in Colombian Amazon
Credits: Planet Labs Inc

SPATIAL FINANCE AND ASSET-LEVEL DATA

GOVERNMENTS
regulate and create
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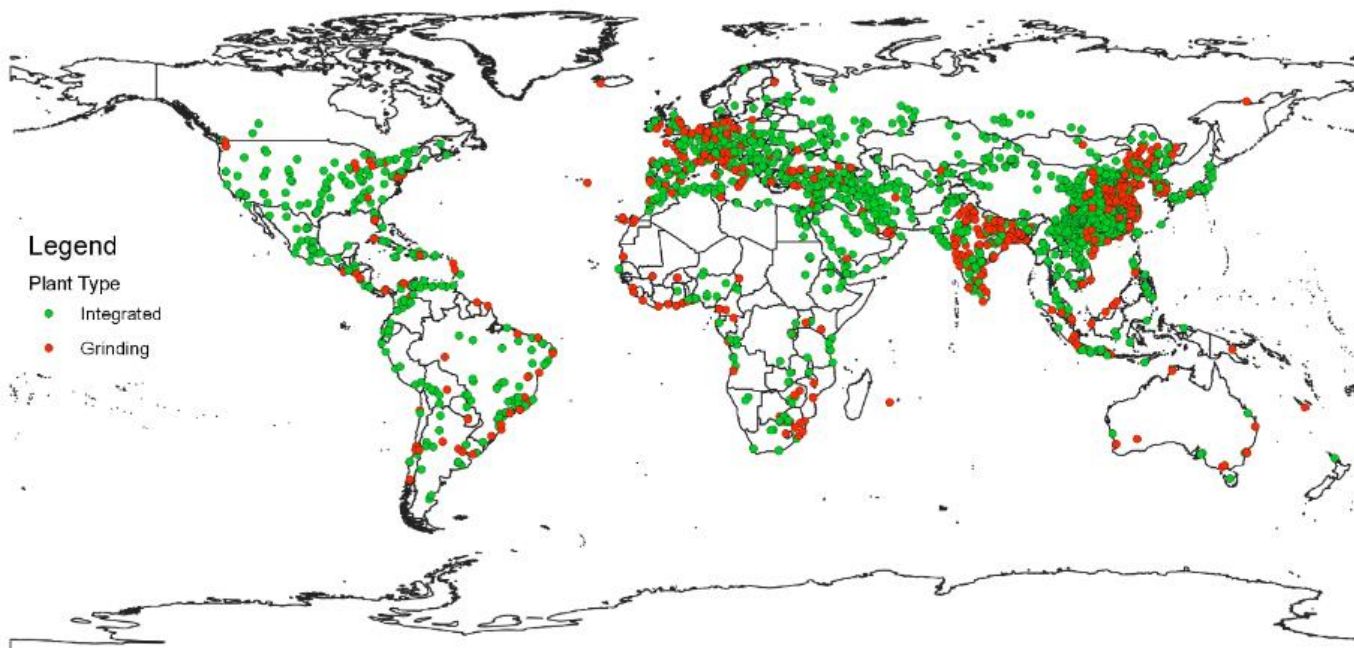


OBSERVATIONAL DATA
E.g. GHG emissions, climate
hazard, air pollution



ASSET DATA
E.g. location, ownership,
production type, capacity, age

ASSET DATA



Cement production plants
Credits: Spatial Finance Initiative

TASKFORCE FOR NATURE-RELATED FINANCE DISCLOSURES

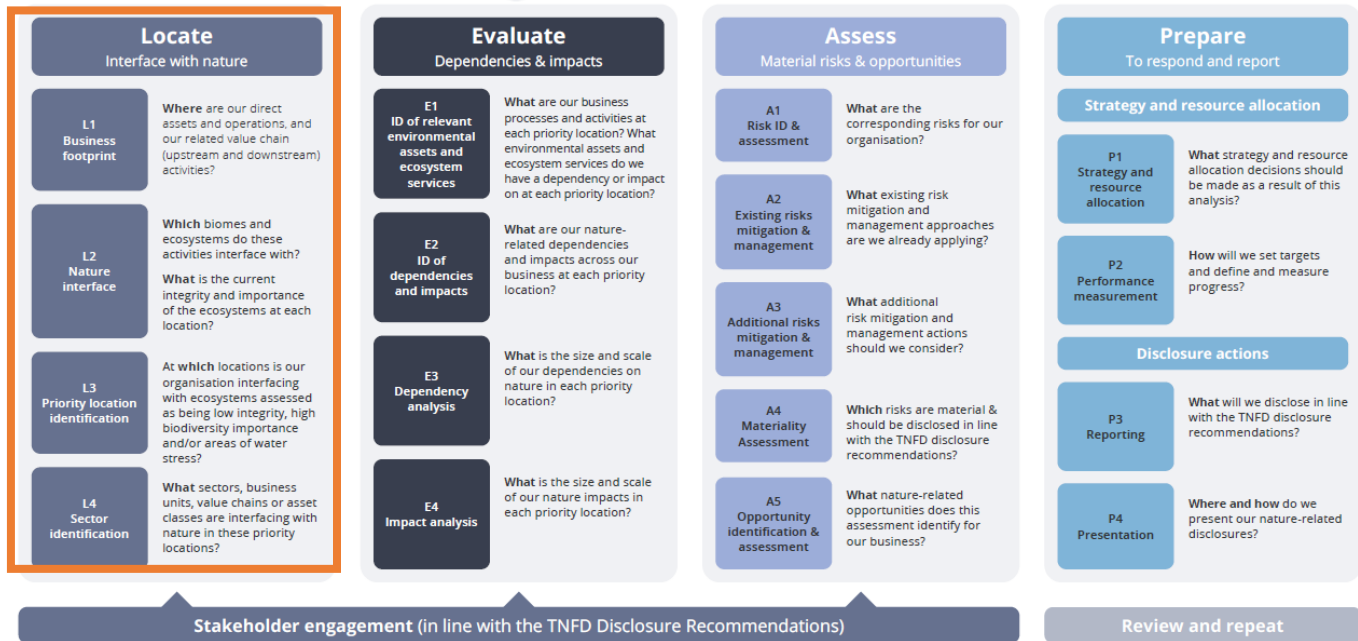
Developing and delivering a risk management and disclosure framework for organisations to report and act on evolving nature-related risks



- “More than **half of the world’s economic output** – US\$44tn of economic value – is dependent on nature.”
- “Currently, **financial institutions and companies don’t have the information they need** to understand how nature impacts the organisation’s immediate financial performance, or the longer-term financial risks that may arise from how the organisation, positively or negatively, impacts nature.”
- The Taskforce consists of 34 individual [Taskforce Members](#) representing financial institutions, corporates and market service providers with **US\$19.4trn in assets**.

Source: Taskforce for Nature-related Financial Disclosures

TASKFORCE FOR NATURE-RELATED FINANCE DISCLOSURES

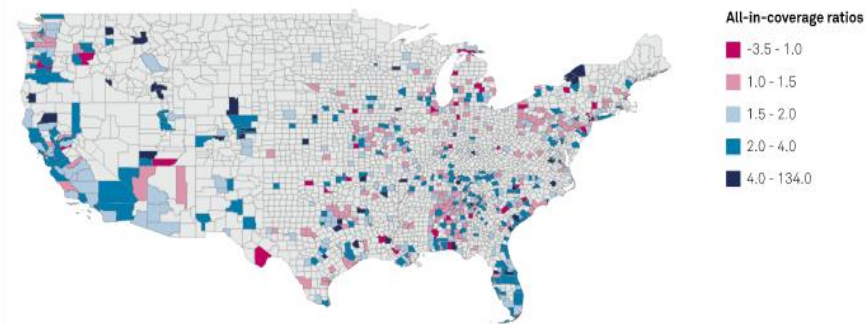


The 'LEAP' approach to assess nature-related risk and opportunities for financial institutions
 Source: Taskforce for Nature-related Financial Disclosures – Beta framework

SPATIAL FINANCE APPLICATIONS

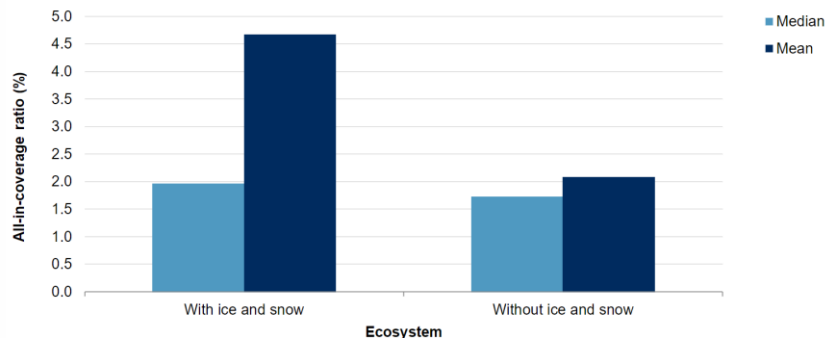
NATURAL CAPITAL RISK

All-In-Coverage Ratios Of U.S. Counties' Water Utilities



Source: S&P Global Ratings.
Copyright © 2020 by Standard & Poor's Financial Services LLC. All rights reserved.

U.S. Public Water Utilities' Credit Metrics May Be Supported By Natural Water Storage In Ice And Snow



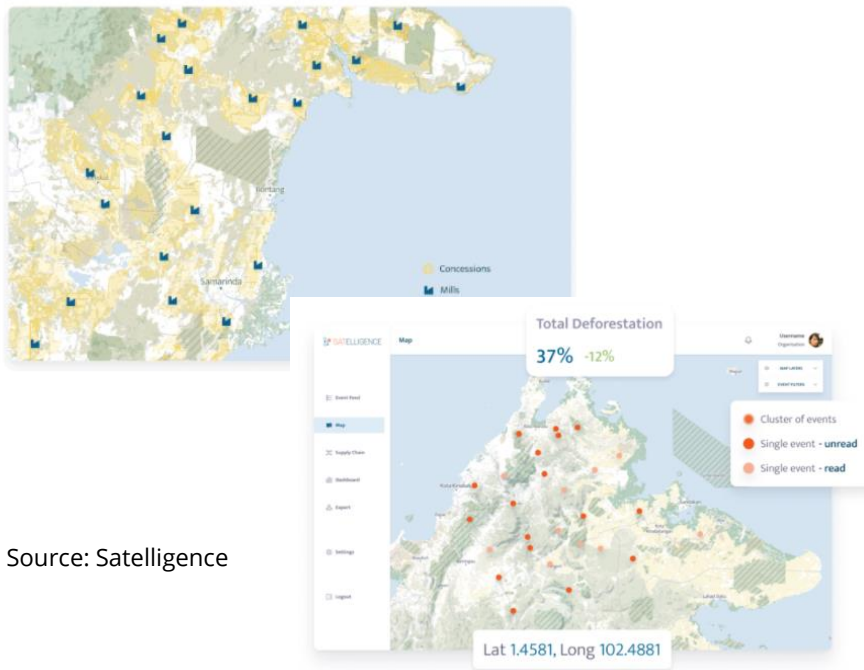
Source: S&P Global Ratings.
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"Space, The Next Frontier: Spatial Finance and Environmental Sustainability"

Source: S&P Global Ratings

SPATIAL FINANCE APPLICATIONS

NATURAL CAPITAL IMPACTS



Source: Satelligence

ACTIAM employs satellite data to combat deforestation

16 September 2019 , Next step towards sustainable investing



Source: Actiam

Investors representing over €1.8 trillion in assets urge companies to advance no-deforestation efforts

03 November 2020 , Action to end deforestation

SPATIAL FINANCE APPLICATIONS

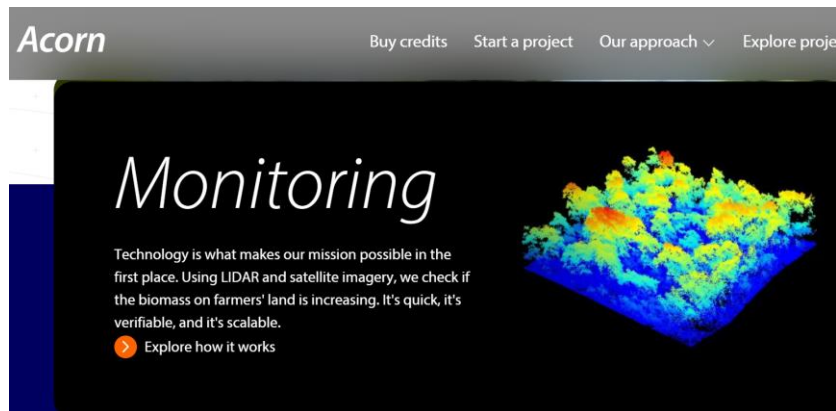
NATURAL CAPITAL OPPORTUNITY



Acorn: a carbon removal system for smallholder farmers.

Together with **Rabobank** and **Microsoft** we are working on **Acorn**, an agroforestry-led carbon removal system aimed at climate preservation, land renewal and food security. ACORN is the only project in the world that uses satellite technology to open the carbon market up to smallholder participation. By working with on-the-ground NGOs, farmers are paid directly from the sale of carbon credits generated by their activities. 80%+ of the sale goes to farmers.

Source: Satelligence



Source: Acorn, Rabobank

Further reading

- Taskforce for Nature-Related Financial Disclosures
 - Beta framework ([Link](#))
 - Nature-related data and analytics availability ([Link](#))
- Nature is too big to fail – WWF & PWC ([Link](#))
- Economics of Biodiversity – Dasgupta review ([Link](#))
- State and Trends of Spatial Finance 2021 – Spatial Finance Initiative ([Link](#))
- Geospatial ESG – WWF ([Link](#))



Source: European Space Agency

THANK YOU

<https://www.cgfi.ac.uk/spatial-finance-initiative/>

Christophe.Christiaen@smithschool.ox.ac.uk

How to apply (1/2)

Register

Register by completing online questionnaire on ESA-STAR Registration (minimum 'light registration') [[Doing Business with ESA](#)]

Download

Download the official tender documentation (Invitation to Tender) via ESA Star Publication '1-11516' from 10th December 2021

Create

Create 'Bidder Restricted Area' in ESA-STAR Tendering

Write

Write your proposal and obtain Letter of Authorization from National Delegation, if needed.

Submit

Submit your proposal via 'Bidder Restricted Area' in ESA-STAR Tendering [[Doing Business with ESA](#)] by the relevant closing date (don't wait until the last minute!)



How to apply (2/2)

The Letter of Invitation to Call for Proposals is issued on ESA-Star Publication [[Doing Business with ESA](#)] under '1-11516' and includes:

Cover Letter



Appendix 1

Activity Description / Statement of Work



Appendix 2

Draft Contract



Appendix 3

Tendering Conditions for Express Procurement Procedure - EXPRO/TC



Appendix 4

Proposal Template

Authorisation from National Delegations

- The **authorization from National Delegation** for the specific Thematic Call against which you submit your Proposal is an admissibility criterion. Proposals not authorized at the closing date of the Thematic Call will not be admitted for evaluation
- For each individual Thematic Call, **dedicated clarifications will be posted in ESA-Star Publication** to provide information on the list of Member States that have already provided their pre-authorization to the Thematic Call
- In case your company/organisation resides in a country which has not provided a pre-authorization to the Thematic Call you are interested in, you need to contact your National Delegation. The contact information of the National Delegations can be found at <https://business.esa.int/national-delegations>

Proposal template

Your Proposal shall include the following information:

1. Executive Summary (max 1 page)
2. Business Potential (max 5 pages)
3. Technical Concept (max 5 pages)
4. Team and Resources (max 3 pages)
5. Management (max 4 pages)
6. Financials (max 2 pages)



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Thank you!
Q&A

NATURAL CAPITAL

Now Open

SUBMIT YOUR PROPOSAL



SPACE SOLUTIONS



ESA UNCLASSIFIED



European Space Agency