



# 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

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European Space Agency



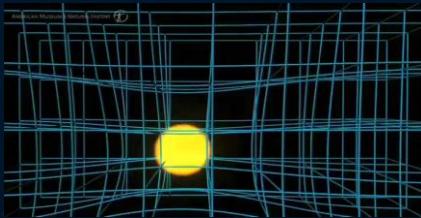
## Agenda

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

The banner features a background image of a small green plant growing out of a glass jar filled with coins, symbolizing growth and investment. To the left, text reads 'NATURAL CAPITAL', 'Now Open', and 'SUBMIT YOUR PROPOSAL'. A tag attached to the jar also says 'CAPITAL'. At the bottom, a URL is provided: <https://business.esa.int/funding/intended-tender/natural-capital>.

# ESA's 4 Main Pillars

## Science and Exploration



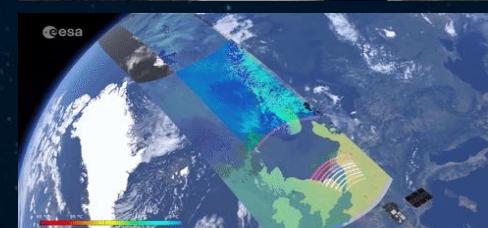
## Enabling and Support



## Safety and Security



## Applications



# ESA SPACE SOLUTIONS

## 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.



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NATURAL CAPITAL

Kick-Start Activity

FIND MORE DETAILS ON OUR WEBSITE

## 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](http://business.esa.int/projects)

## Space Technology...



Earth  
Observation



Satellite  
Navigation



Satellite  
Communication



Spaceflight  
Technologies



Space  
Weather

## ... coupled with...

Big Data analytics

VR/AR

Artificial Intelligence

Mega-constellations

Crowdsourcing

IoT

Cybersecurity

Blockchain

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

## ... to serve Users & Market



Maritime



Environment



Financial



Education



Energy



Agriculture



Healthcare



Transport



Media



Aviation

## 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.



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# 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 restauration 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.

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Guest speaker #1

[Claire Wansbury](#)

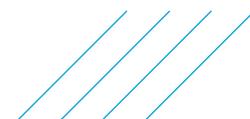
Fellow and Technical Authority on  
Biodiversity and Natural Capital, Associate  
Director of Ecology at ATKINS



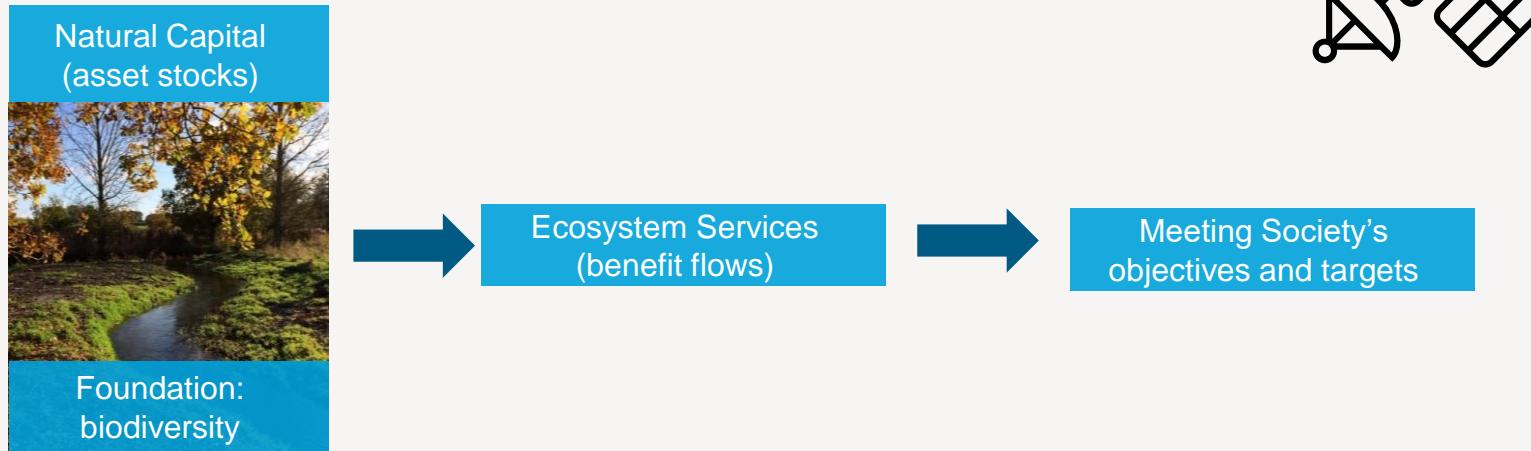


# Natural Capital and the European Space Agency: Why we need space science to enable a nature-positive future

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.

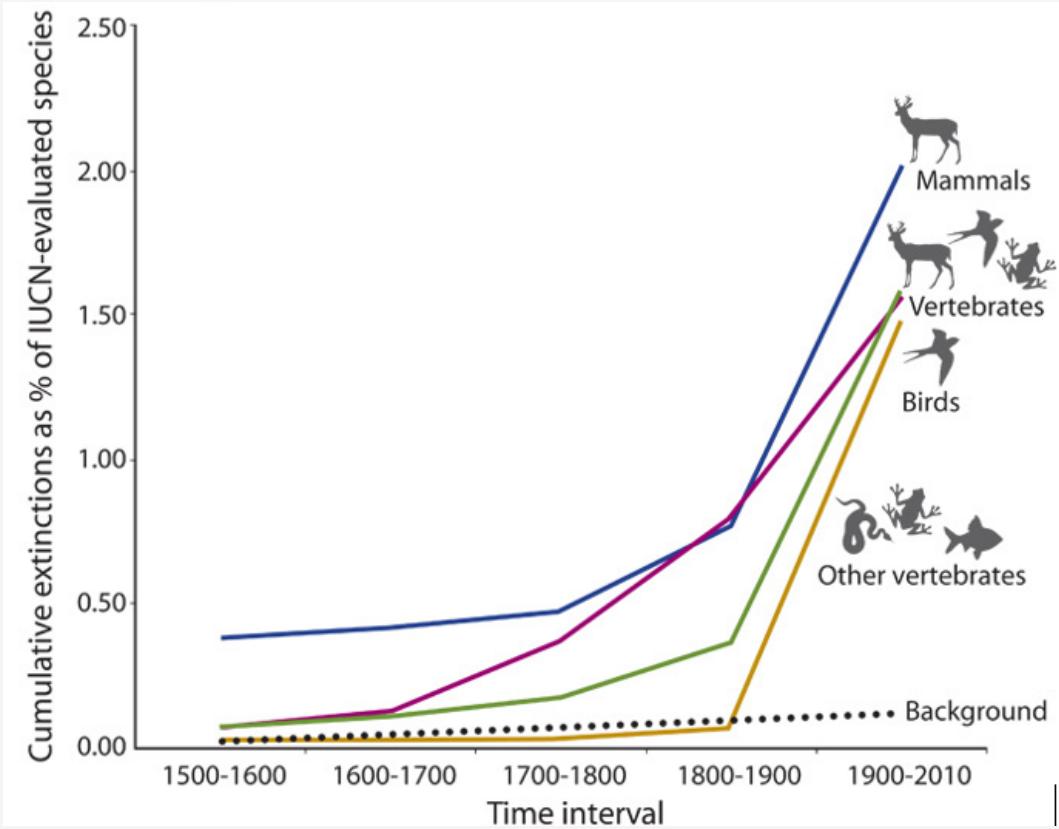
Biodiversity is a key part of our  
natural capital, underpinning  
delivery of many ecosystem  
services.



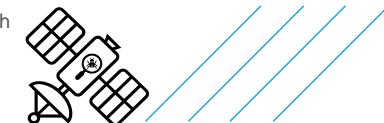
Photo credit London Wildlife Trust

# 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*

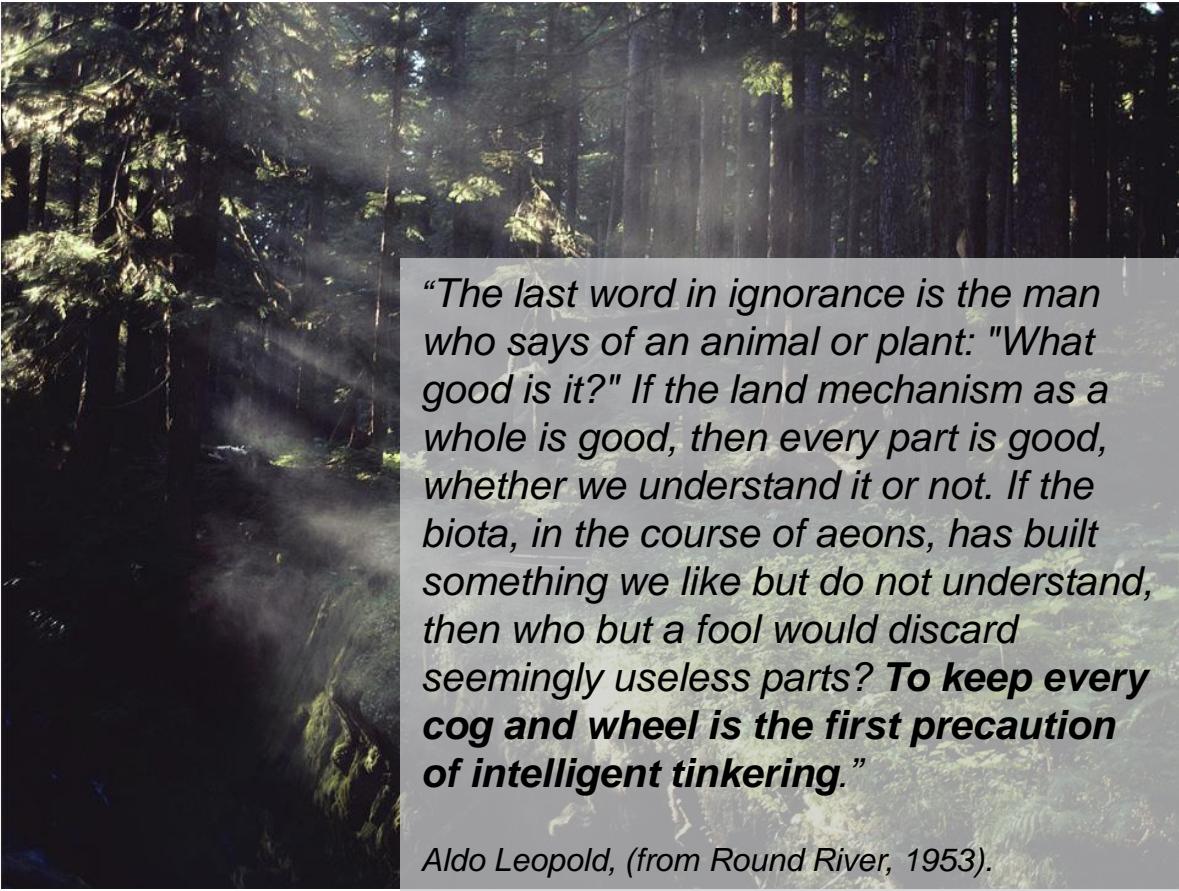


Accelerated modern human-induced species losses: Entering the sixth mass extinction. Ceballos, G. et al, Science Advances, 2015  
[www.science.org/doi/10.1126/sciadv.1400253](http://www.science.org/doi/10.1126/sciadv.1400253)



# 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



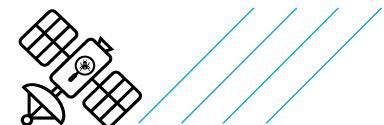
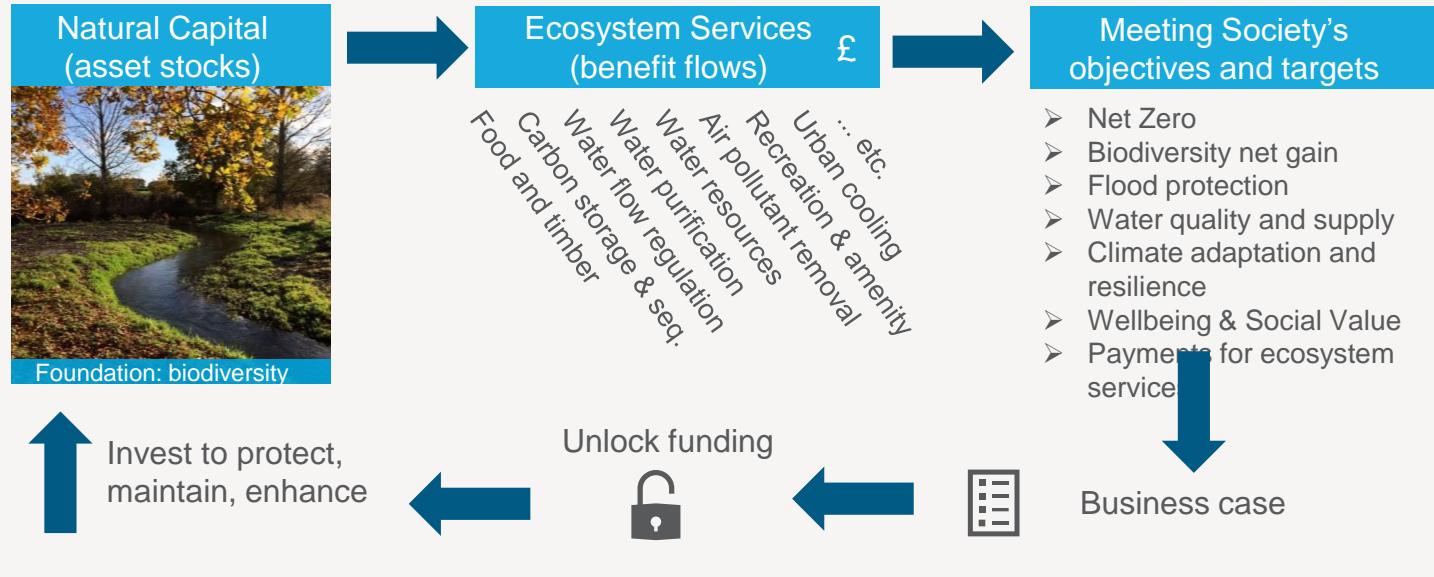
*“The last word in ignorance is the man who says of an animal or plant: "What good is it?" If the land mechanism as a whole is good, then every part is good, whether we understand it or not. If the biota, in the course of aeons, has built something we like but do not understand, then who but a fool would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

Aldo Leopold, (from Round River, 1953).

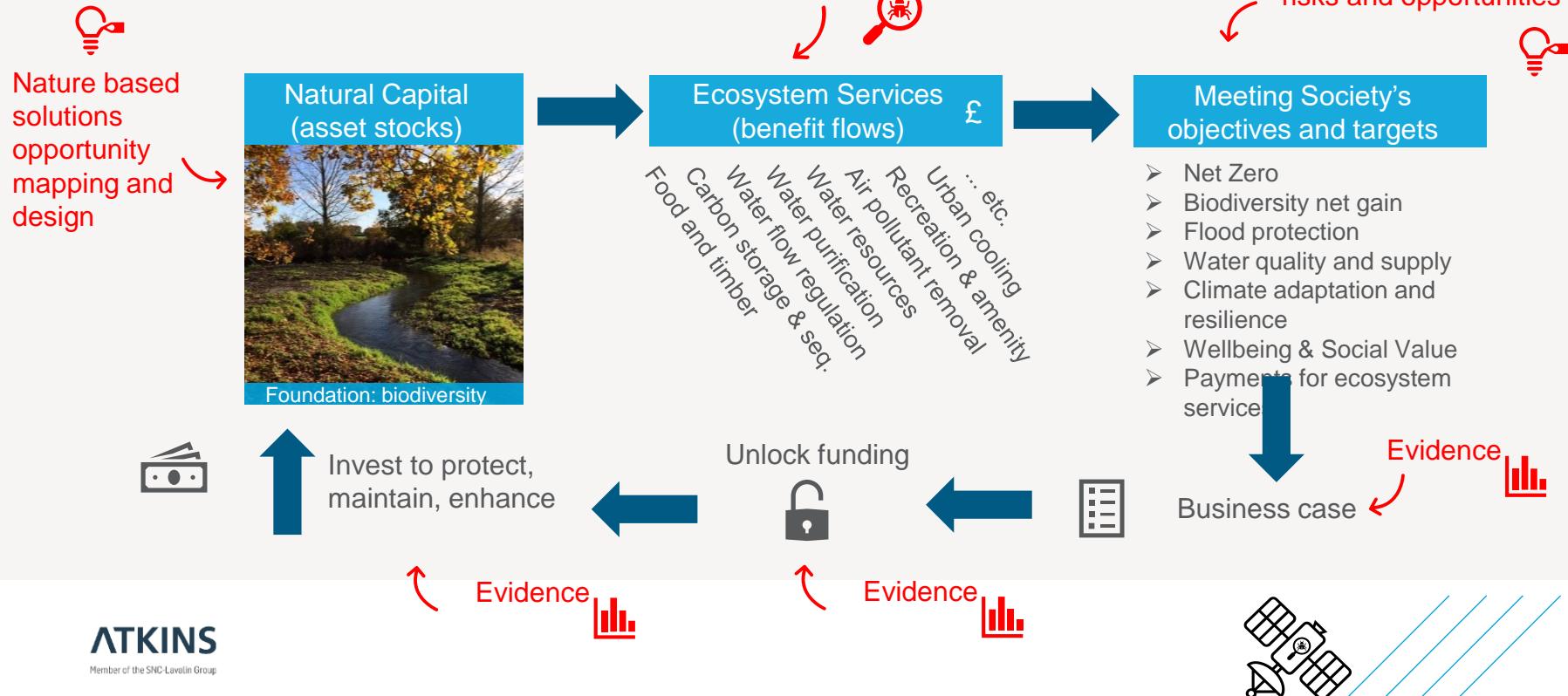


# How does ‘Natural Capital’ benefit us, and how can understanding and valuing Natural Capital benefit nature?

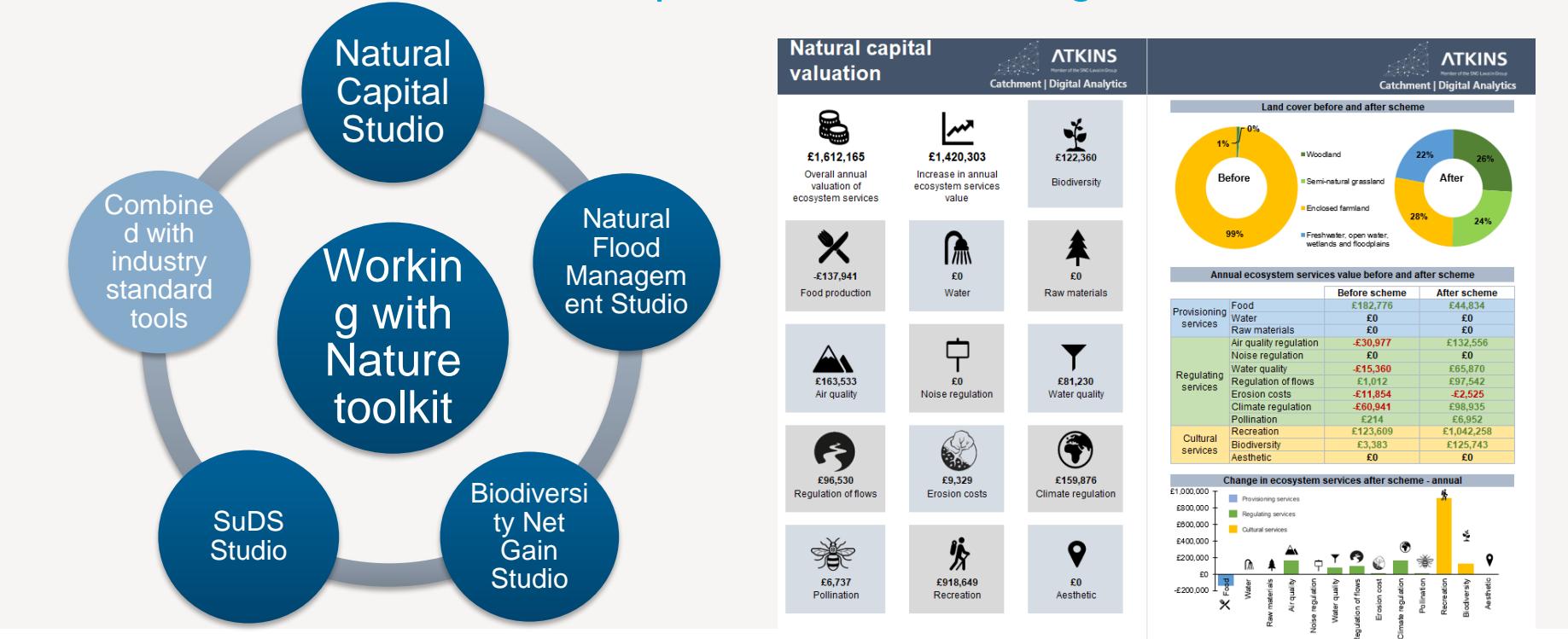
Ecosystem services are provided for free, so are traditionally not values in cost / benefit decisions



# Why do we need data?

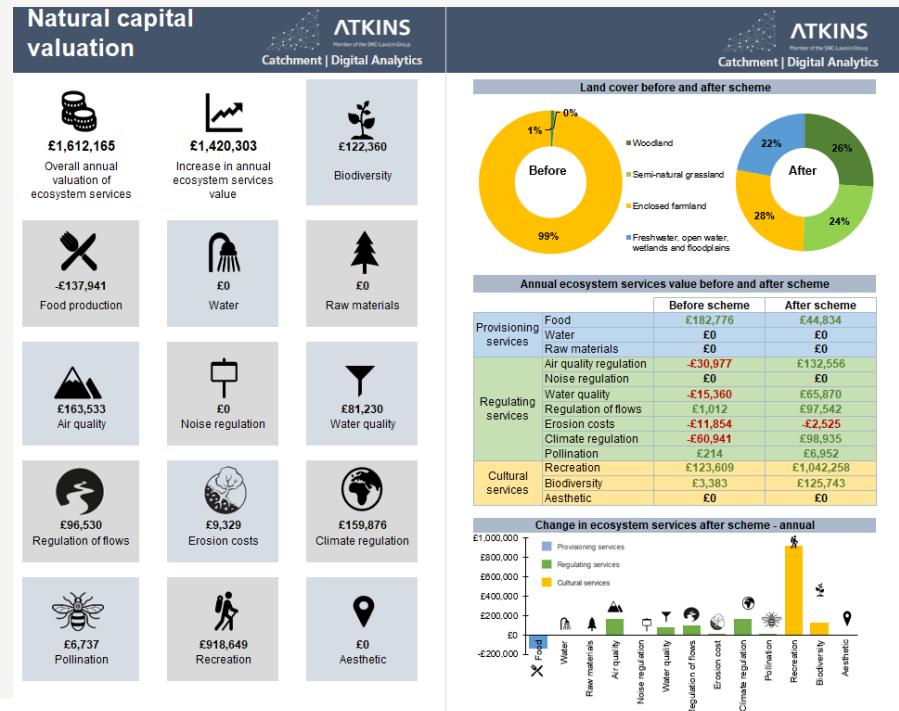


# How can we use data? Example - Atkins' 'Working With Nature' Toolkit



**ATKINS**

Member of the SNC-Lavalin Group



# 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.

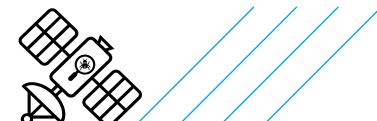
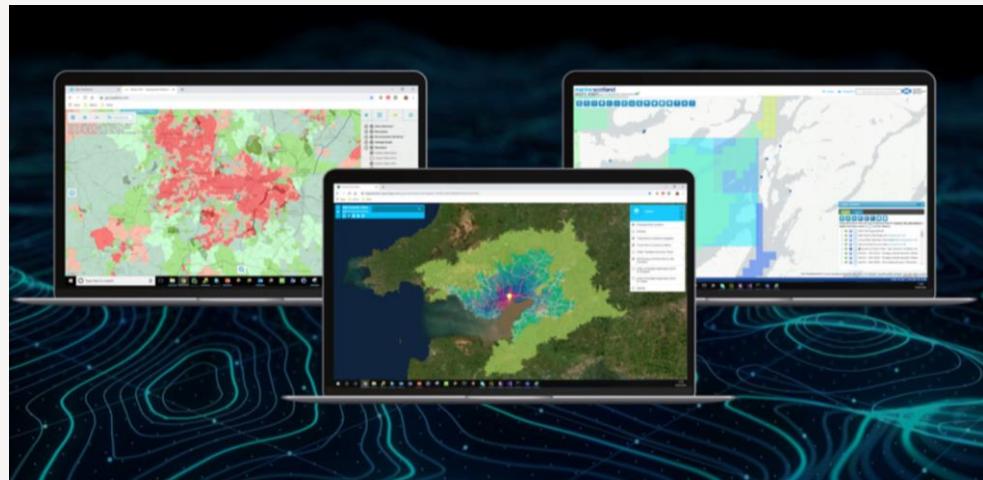


Eurasian beaver (courtesy of Russell Savory)



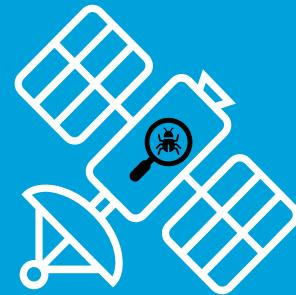
# How can Space Data and Technology help protect and restore natural capital?

- 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.snc-lavalin.com/~media/Files/S/SNC-Lavalin/download-centre/en/brochure/valuing\\_our\\_natural\\_capital.pdf](https://www.snc-lavalin.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



A large, semi-transparent white diagonal line starts from the top right corner and extends towards the bottom left, partially obscuring a background image of industrial pipes and structures.

Christophe Christiaen  
7<sup>th</sup> 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



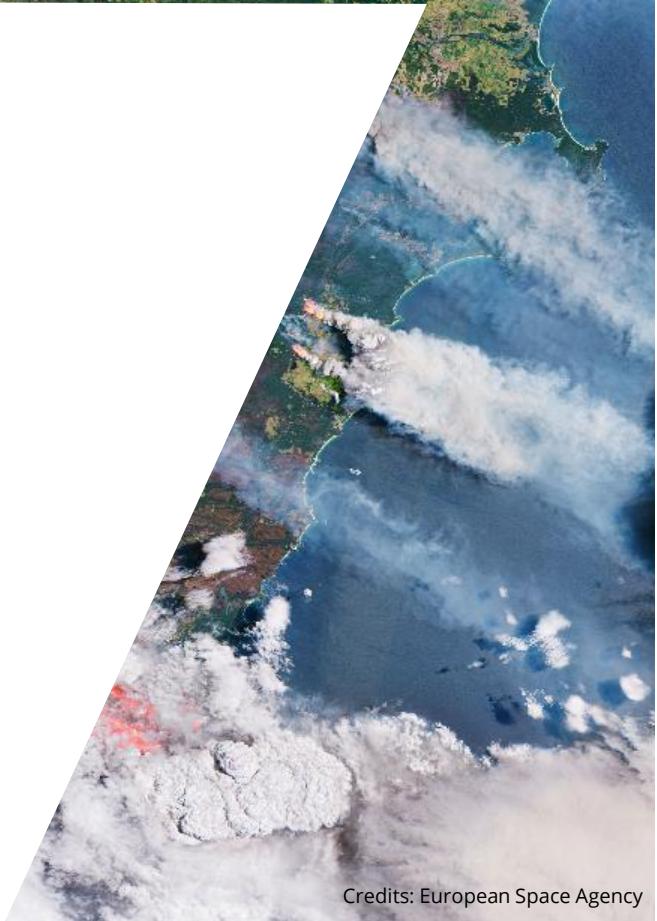
# MARKET DEVELOPMENTS

**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

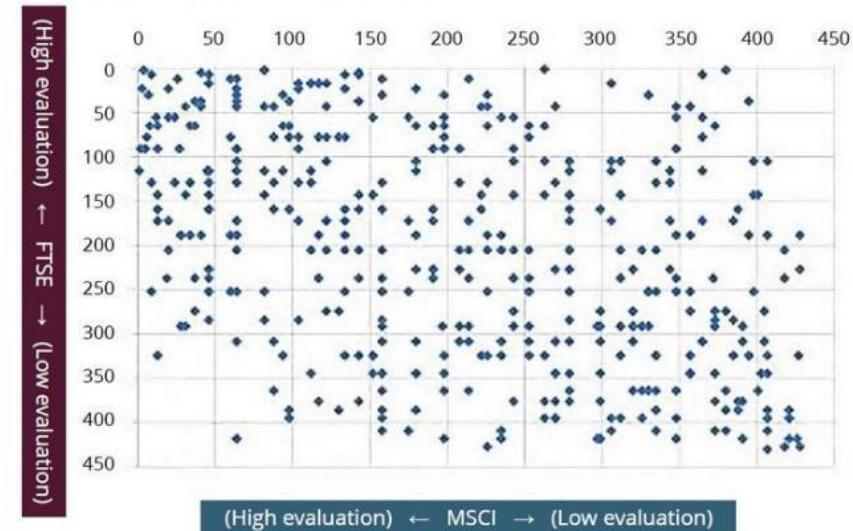
# DATA CHALLENGES

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

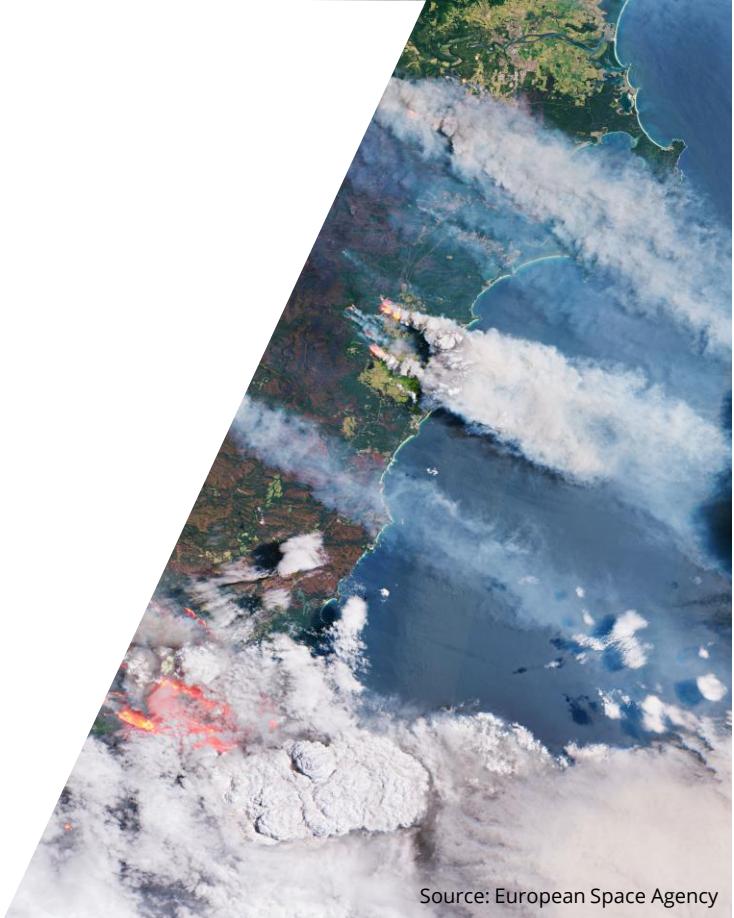
## RELEVANCE OF GEOSPATIAL SOLUTIONS

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

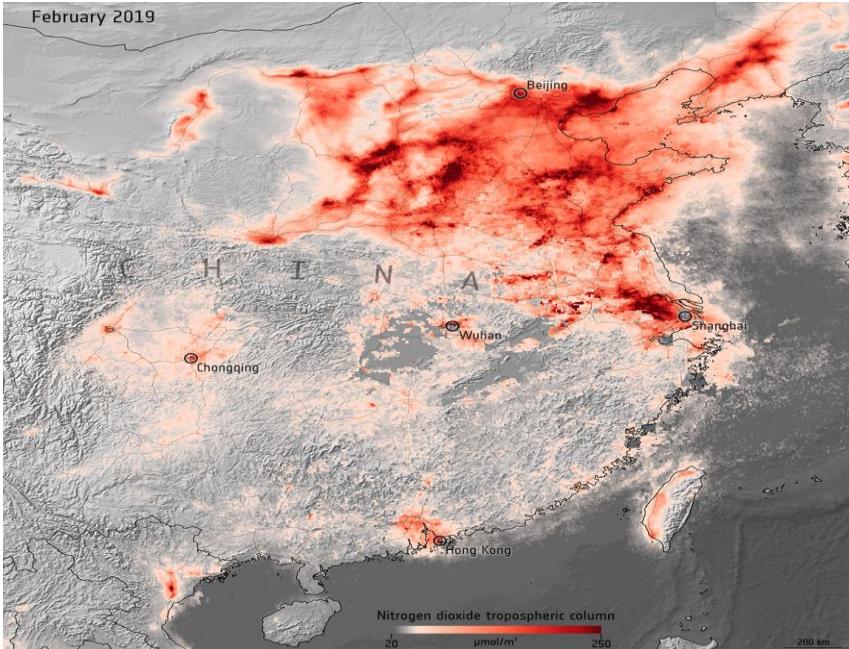


Source: European Space Agency

# SPATIAL FINANCE AND ASSET-LEVEL DATA



# OBSERVATIONAL DATA



Nitrogen dioxide emissions over China  
Credits: ESA

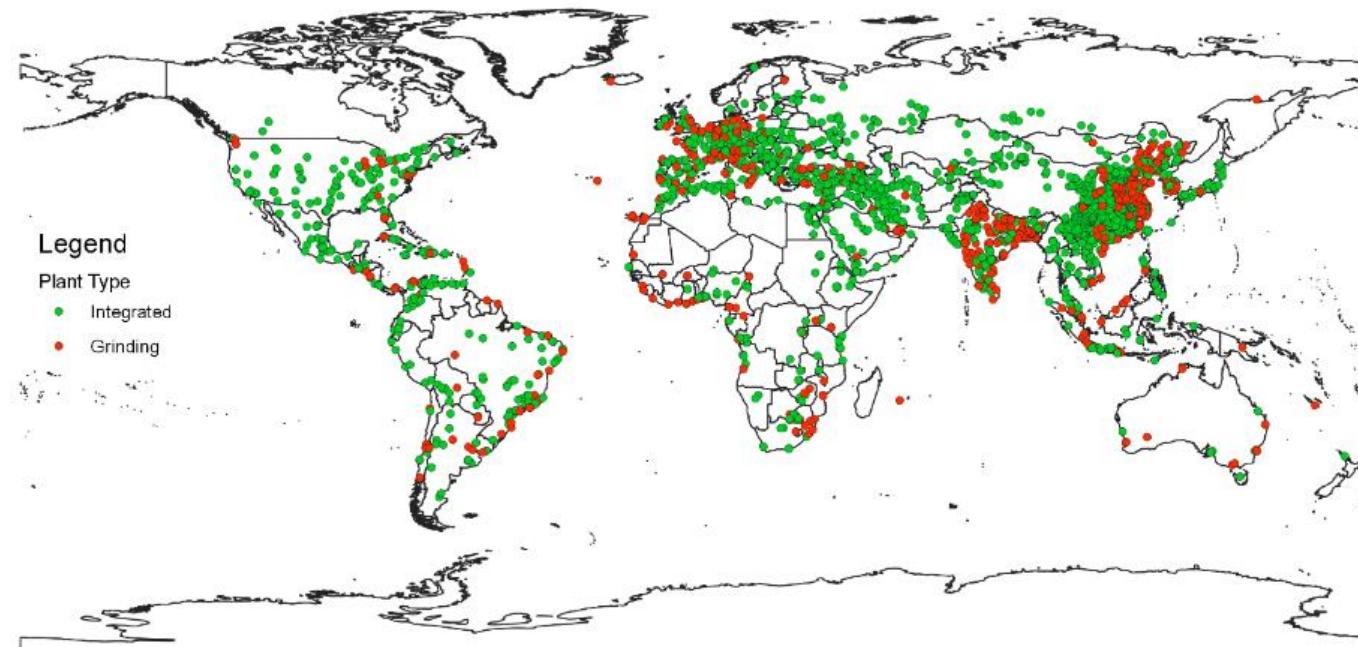


Deforestation in Colombian Amazon  
Credits: Planet Labs Inc

# SPATIAL FINANCE AND ASSET-LEVEL DATA



# ASSET DATA



Cement production plants  
Credits: Spatial Finance Initiative

# TASKFORCE FOR NATURE-RELATED FINANCE DISCLOSURES

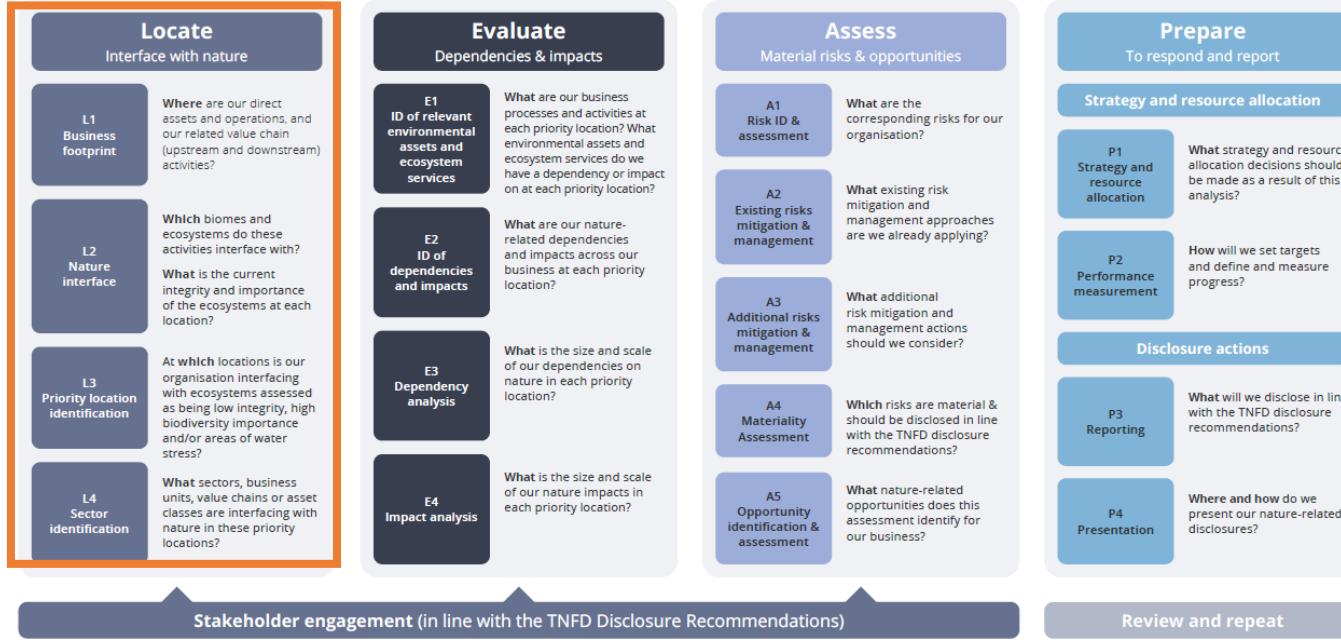
**Developing and delivering a risk management and disclosure framework for organisations to report and act on evolving nature-related risks**



- “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

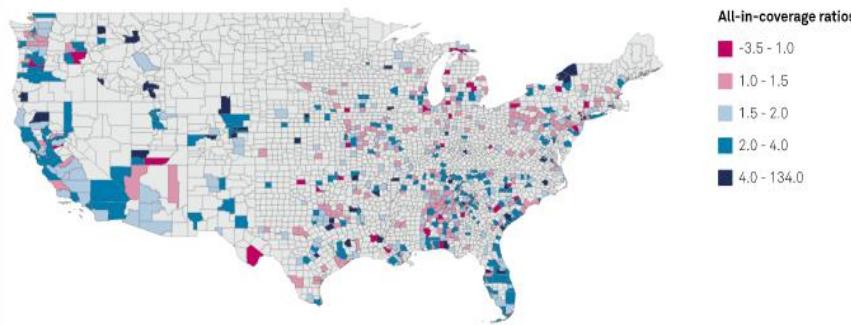
# TASKFORCE FOR NATURE-RELATED FINANCE DISCLOSURES



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

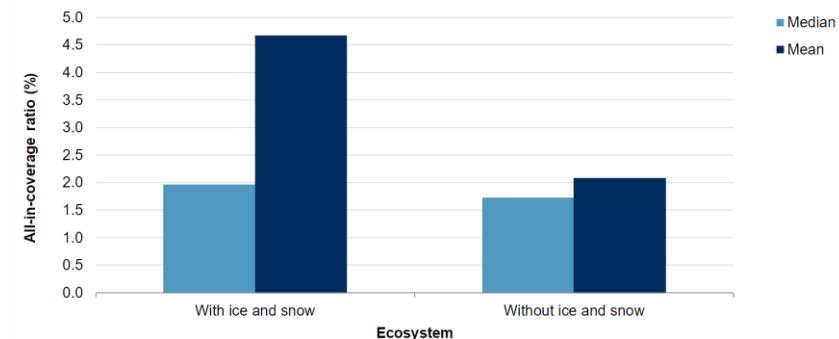
# SPATIAL FINANCE APPLICATIONS NATURAL CAPITAL RISK

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



Source: S&P Global Ratings.  
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U.S. Public Water Utilities' Credit Metrics May Be Supported By Natural Water Storage In Ice And Snow

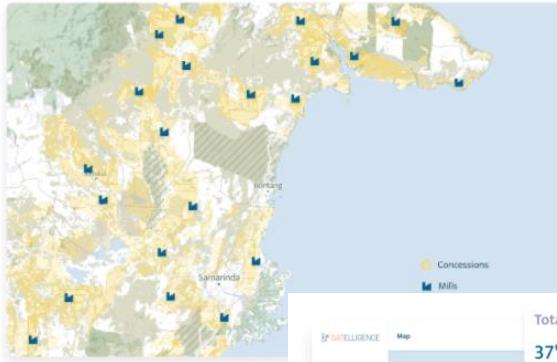


Source: S&P Global Ratings.  
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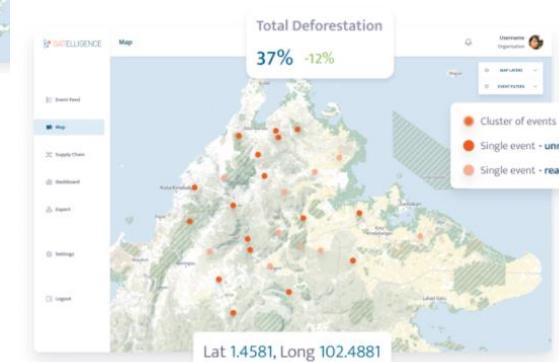
"Space, The Next Frontier: Spatial Finance and Environmental Sustainability"

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**

— 05 November 2020 , Action to end deforestation

# SPATIAL FINANCE APPLICATIONS

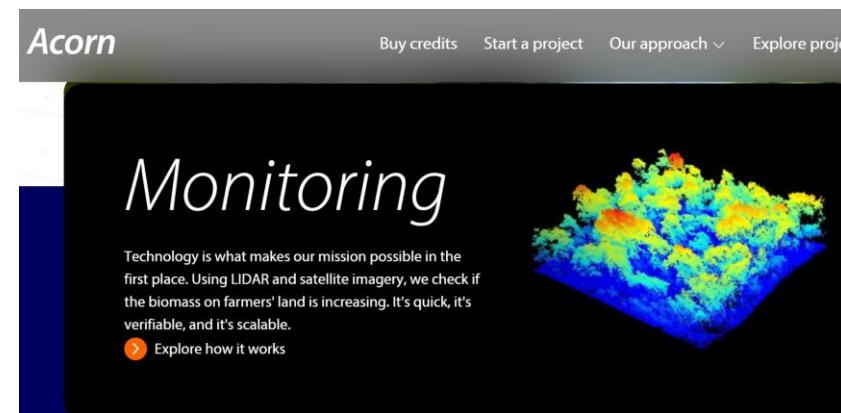
## NATURAL CAPITAL OPPORTUNITY



Source: Satelligence

### 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.



The screenshot shows the Acorn website's "Monitoring" section. At the top, there is a navigation bar with links: "Buy credits", "Start a project", "Our approach", and "Explore projects". Below the navigation, the word "Monitoring" is displayed in large, white, serif font. To the right of the text is a 3D perspective view of a forest area, where different colors represent varying levels of biomass or carbon density. A small orange button labeled "Explore how it works" is located at the bottom left of the main content area.

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](#))



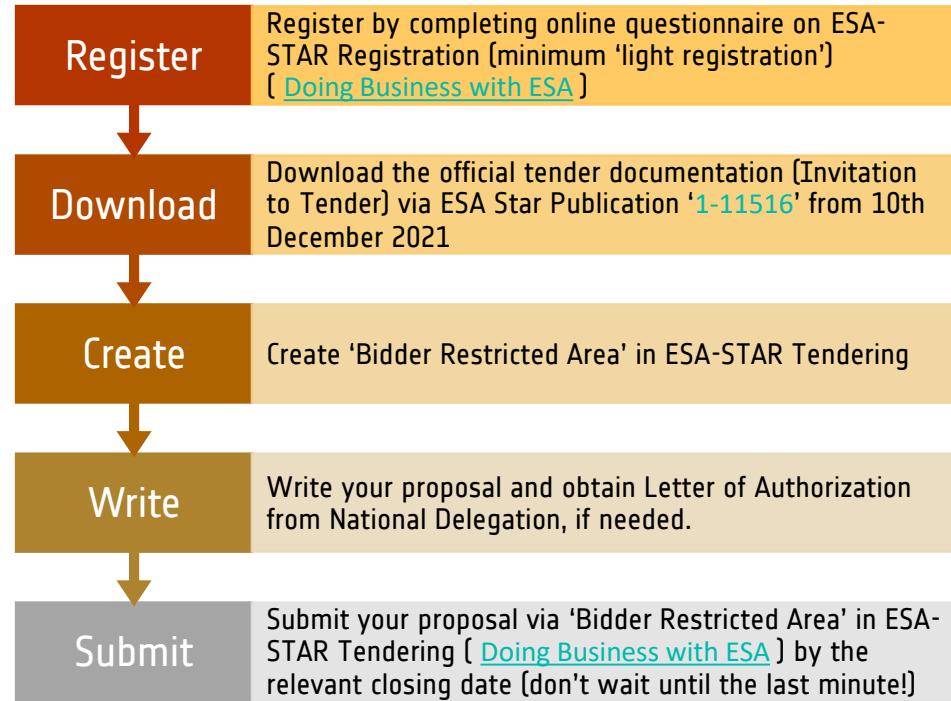
Source: European Space Agency

# THANK YOU

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

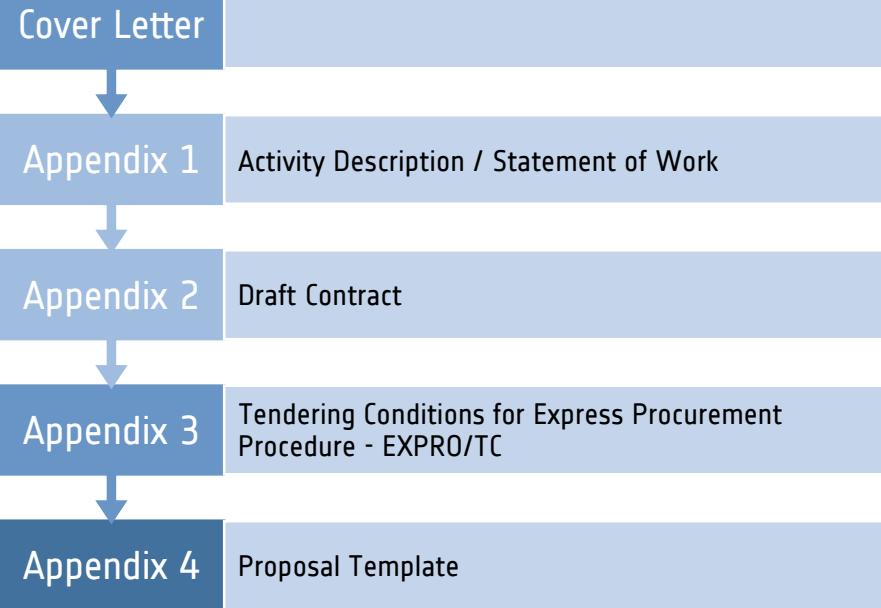
Christophe.Christiaen@smithschool.ox.ac.uk

## How to apply (1/2)



## 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:



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## 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

