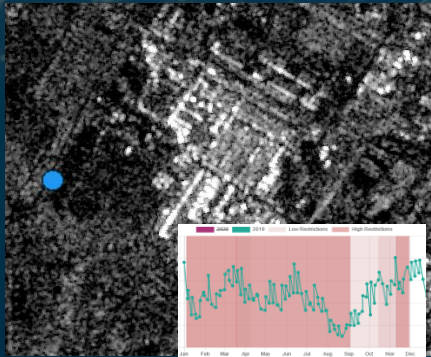


Earth Observation for Finance

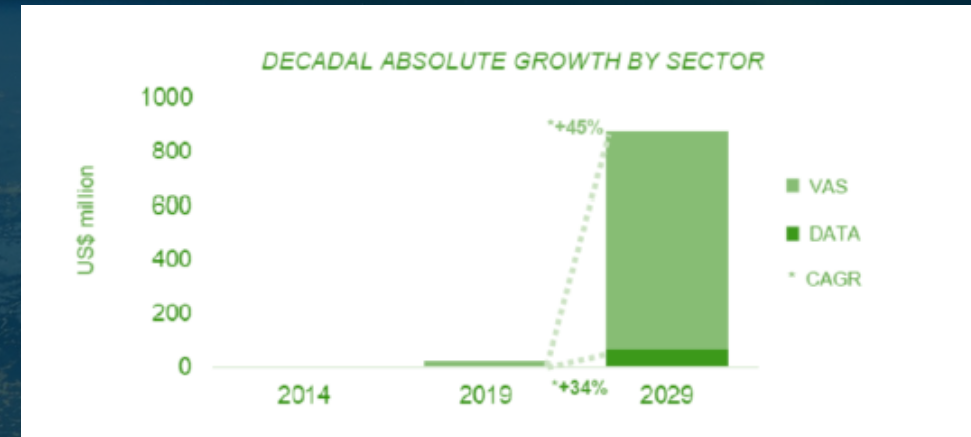
29th April 2021

What is Earth Observation (EO) from Space

- EO Satellites orbit the Earth, providing long term systematic data using different types of physics
- New Space: Lots of data, improved technology, connected thinking & ICT, entrepreneurs, Investors, new business models
- Moving from image provision to value adding services
 - Examples
 - emissions, waste, effluents, GHG, local hydrology, biodiversity, land stability, urbanisation
 - Detect changes (before and after)
 - Support forecasting
 - Using cutting edge technology e.g. AI, blockchain, edge computing
 - Turning data into information and knowledge for decision making
 - Ranging from global scales to much smaller scales
- We are always looking for partnerships/collaborations to support research & dev. as well as commercial/close of EO market products & services



- We see a growing interest in green and sustainable finance
- EO can help
- Providing independent & reproducible analytics e.g. supporting compliance monitoring requirements & KPIs

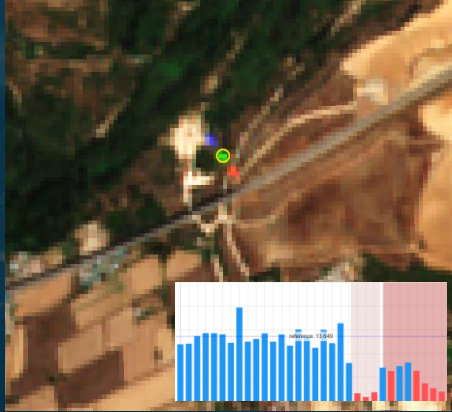
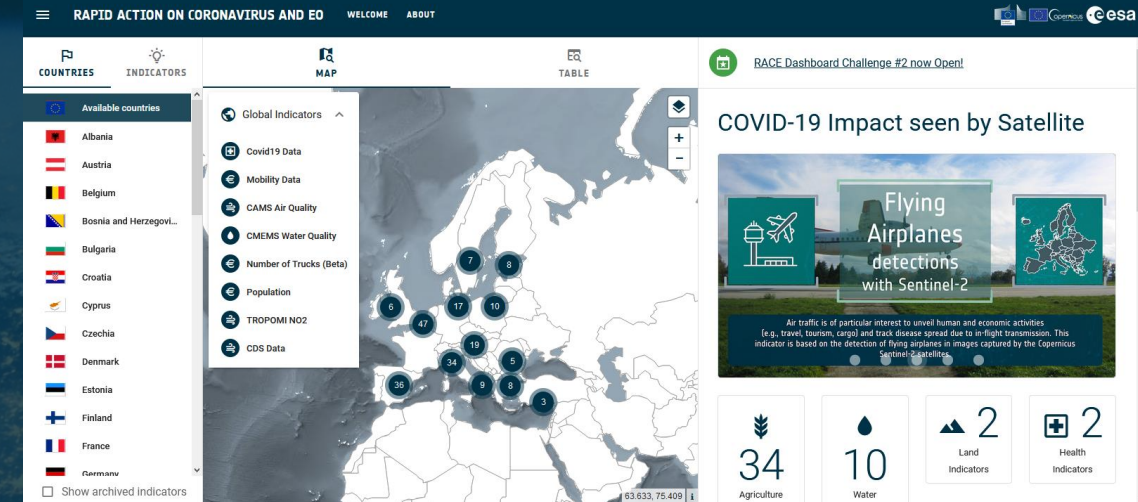


Finance is an emerging sector that is expected to be the fastest growing through the next decade. While currently in the uptake phase, a market of more than \$870M is anticipated by 2029. (Source Euroconsult 2020)

- We can offer collaborations on all above process steps of the financial sector
- Banks, investment companies, insurance companies, real estate firms and commodity trades

Economic indicators on COVID19 impacts by Earth Observation <https://race.esa.int/>

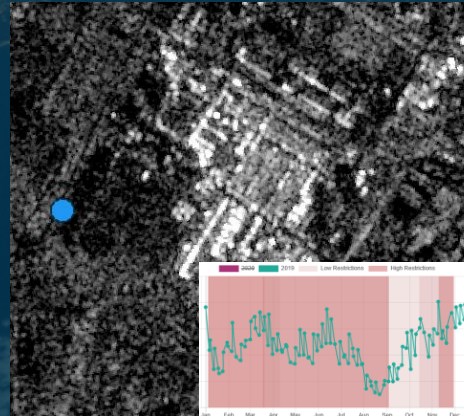
- RACE dashboard developed in collaboration with DG DEFIS and involving 30+ companies:
- Features a range of economic indicators, each looking at different aspect of the economy and socio-economic system
- Several indicators for economy, air- and water quality, agriculture (...) track the impact of the pandemic and the progress of the recovery



Flying airplane detection (S2)
– community contributed



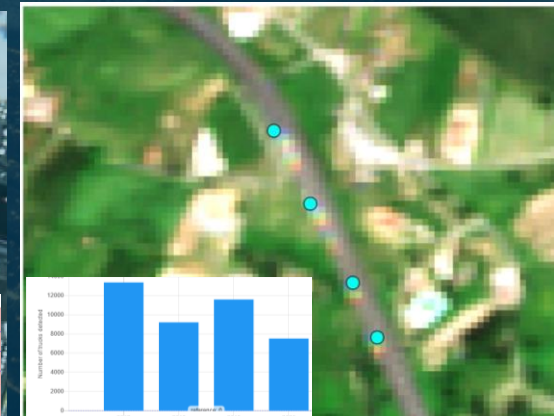
Parked airplanes
detection (S2)



Output inventory level
production sites (S1)



Vessel detection on
commodity import
piers (S2)



Driving truck detection (S2) –
community contributed

Copernicus Sentinel 1 Satellites (S1), Copernicus Sentinel 2 Satellites (S2)

Objective

e-Drift - Disaster Risk Financing and Transfer (Risk Transfer for Insurance), financed by ESA and led by CIMA Research Foundation, provides a fully automatic and reproducible method to extract flood records using Sentinel data to support disaster risk transfer & insurance.

- A Virtual Link to the Space Segment embedding co-located data and processing into hydrological modelling.
- Objective and near real time observations used against risk profile to trigger decisions
- Services already in operation with several customers through an insurance broker based in Singapore.

EO sector Partners

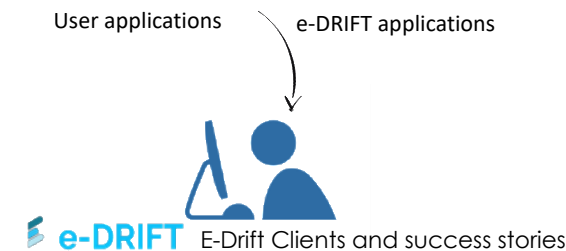
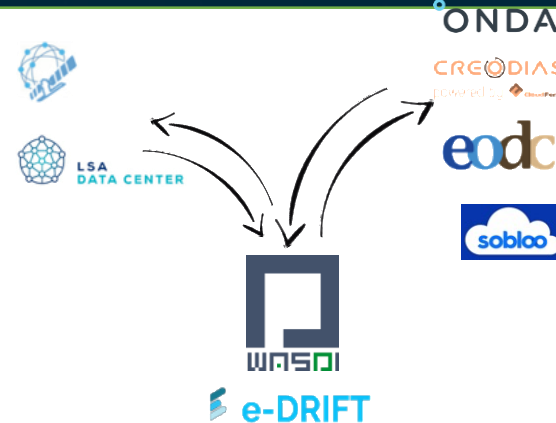


End Users & in-sector providers



<http://edrft.cimafoundation.org>

<https://www.wasdi.net/>



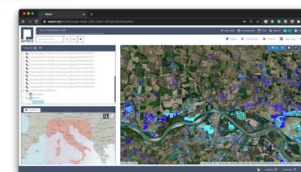
SEADRIF parametric insurance



Bolivian CP forest Fire detection



Generali Flood Parametric Insurance- Italy



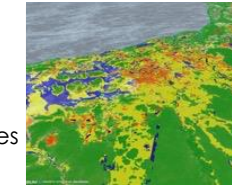
The fruit of the ESA EO programme
'Industry Growth/Expand Demand'

e-DRIFT Services and applications

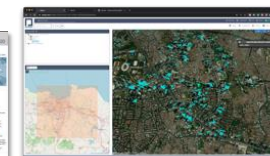
Exhaustive S1 flood archives
Empirical flood frequency



Merged optical and SAR flood maps



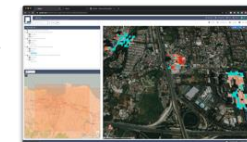
SAR flood maps in Urban Areas



Automated and on demand flood delineation worldwide



Affected People estimates



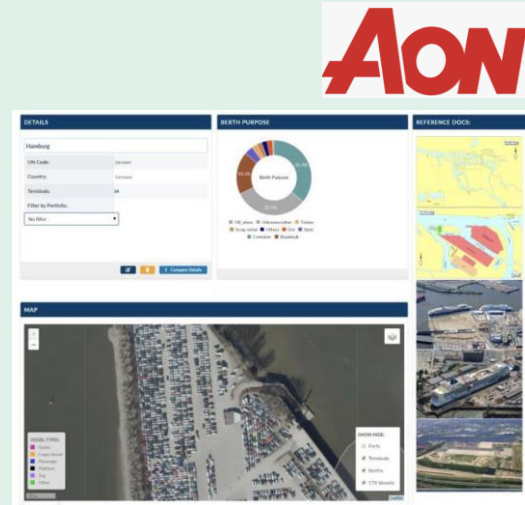
Φ-Lab Investing in Industrial Innovation (InCubed) examples



Aim: To stimulate and develop commercial EO data products and services

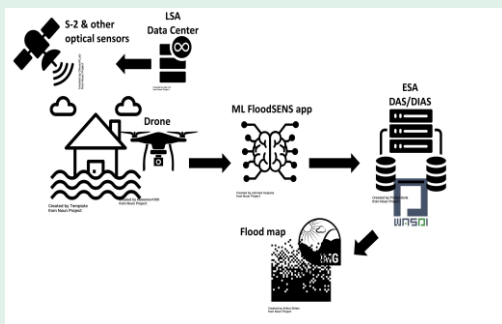
<https://philab.phi.esa.int/>

EO & GNSS enhancements to React platform to support risk exposure. Software as a service for insurance & reinsurance industry

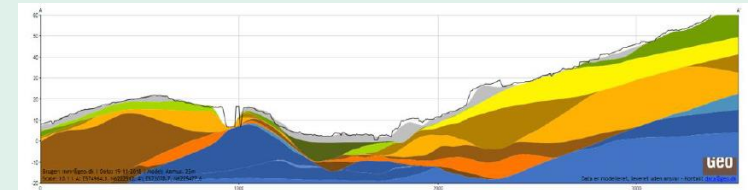


<https://incubed.phi.esa.int/>

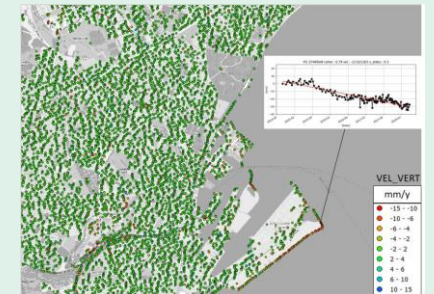
Online platform to globally visualise levee failure risk combining high resolution soil moisture info with InSAR deformation data & other EO data



FloodSENS is an app based on machine learning for flood detection for actionable high res. geospatial info e.g. insurance



Integration of InSAR ground motion products with subsurface geotechnical models (InSARinSub) used for infrastructure monitoring



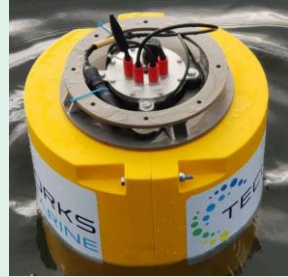
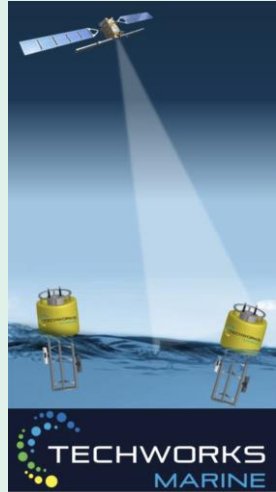
Φ-Lab InCubed programme examples

Aim: To stimulate and develop commercial EO data products and services



<https://philab.phi.esa.int/>

CoastEO aims to be a validated water quality commercial service with coastal monitoring using low cost buoy platforms & satellite data



in accordance with CAP & Green Deal Agenda
EO Widget integrates EO data using cloud based widgets for ICT providers to support e.g. direct client payments by 2024 e.g. agencies, etc

GeoVille

EOX



Mission and Agile
Nanosatellite for
Terrestrial Imagery
Services focused on serving the energy sector

<https://incubed.phi.esa.int/>

Focused on
serving oil/ gas/
energy sectors

OPEN COSMOS



GEO4A

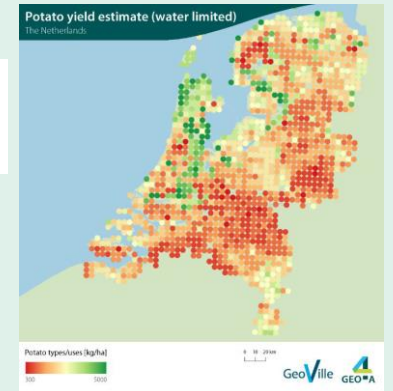
GeoVille

eodc

GERMESS

HLB
research and consultancy in agriculture

Data Platform to support agro-food
industry leading to a spun out start-up
Focusing on maximising potato yield



New Regulations for Sustainable Finance

Opportunities for EO applications can come from new legal frameworks that regulate sustainable finance e.g. reporting 'greenness' of investments

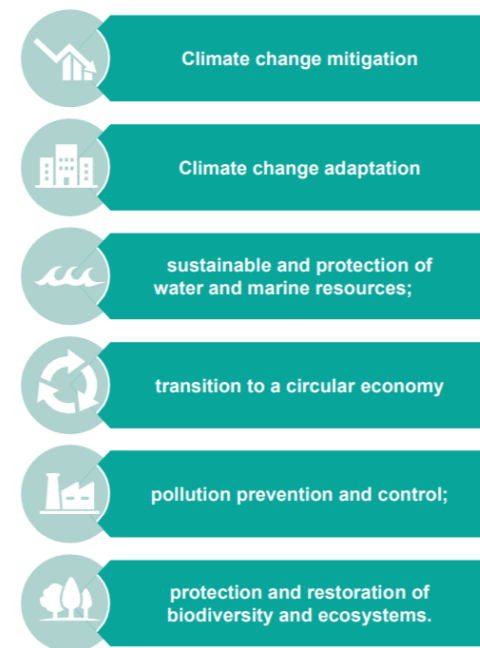
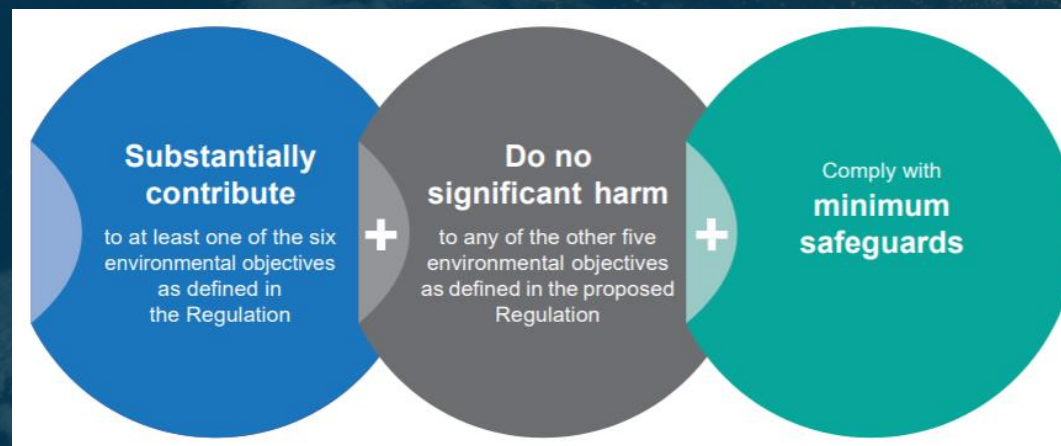
Evident role to manage likely gaps in performance data

The EU Taxonomy Regulation for Sustainable Finance (2020/852) - a framework to facilitate sustainable "green" investment strategy

- a key piece of legislation that will contribute to the **European Green Deal** by boosting private sector investment in green and sustainable projects
- Clearly specified 6 environmental objectives to be met by private sector investors

Technical Screening Criteria (TSC)

- Specific reporting systems to prevent false claims
- Compliance monitoring
- Significant opportunities for collection of data over the whole life cycle of economic activities



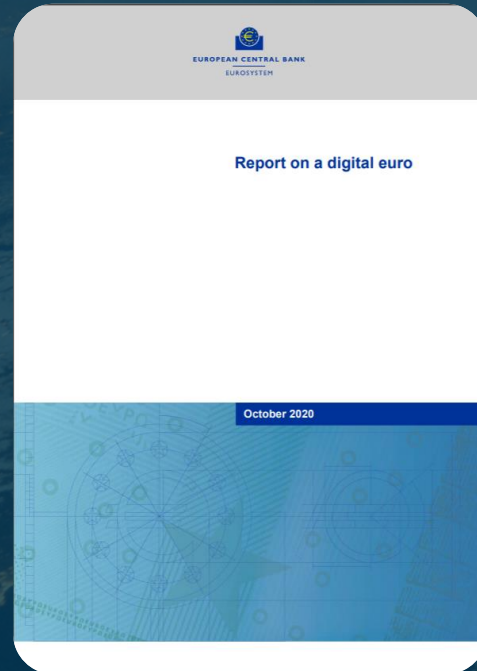
Opportunities for EO supported solutions

Digital Innovation in financial technology:

Digital Euro, Digital Dollar, Digital CBDCs ...



Bank for
International
Settlements



European
Central Bank



G20
Financial
Stability Board



The Digital transformation is accelerating in the finance sector

Green FinTech is connecting the world of sustainable finance with innovation in financial technology

Emerging innovative concepts intersecting FinTech and sustainable finance

Objective is to better channel financial resources towards environmentally sustainable companies/projects and develop new innovative financing instruments



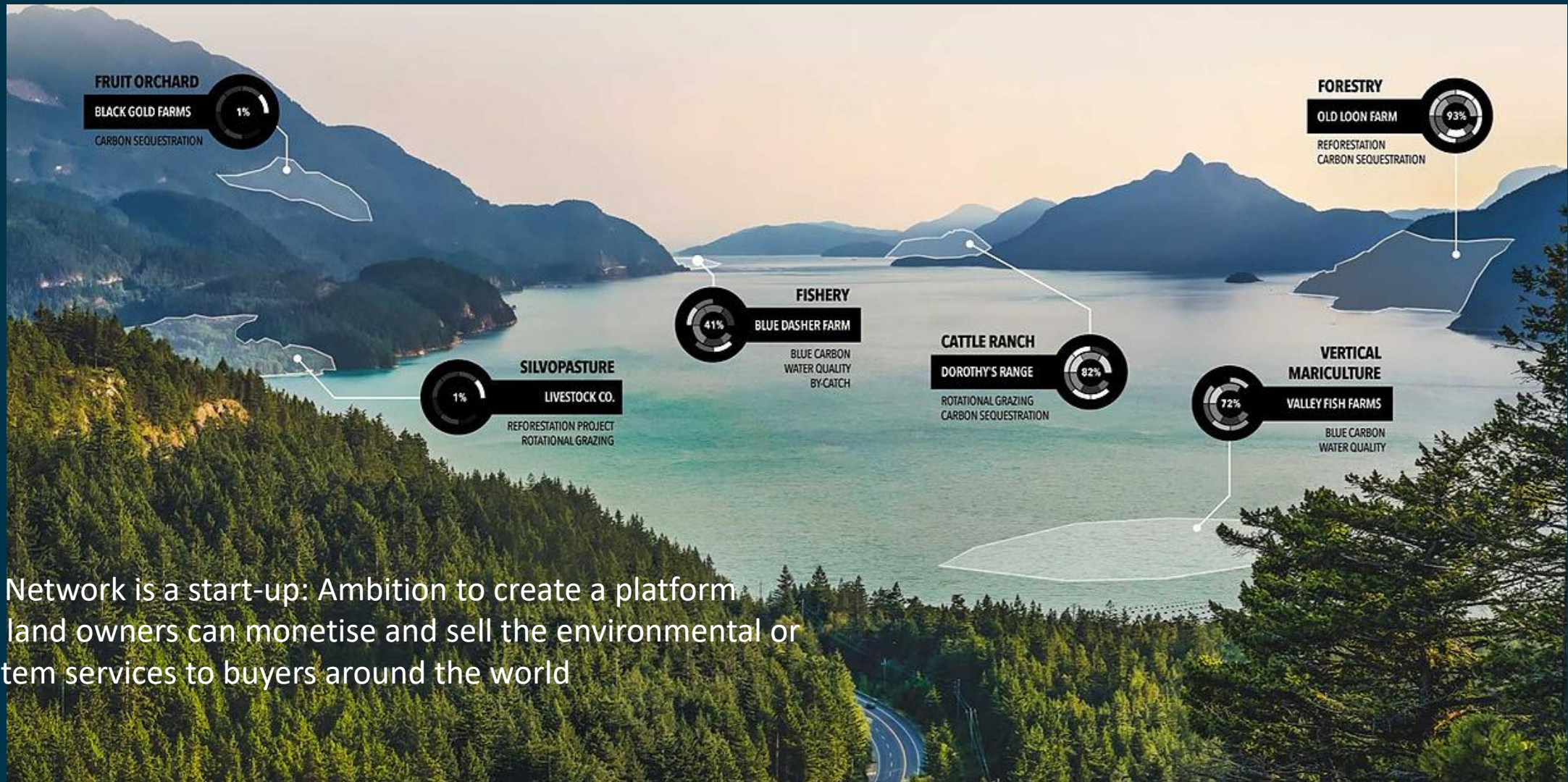
- Tokenisation of sustainable assets
- Tokenisation of sustainable land use projects
- Tokenisation of investment debt in sustainable forestry assets
- Fractional assets ownership
- GHG emissions trading?

⇒ Distributed Ledger Technology innovation represents technological opportunity for transforming and accelerating ecosystems around green (digital) assets

⇒ Currently EO/GNSS considered key enabling technologies for natural assets tokenisation (track and trace)

When FinTech meets nature...

Incentivize, reward, track and verify ecological impact – in real time



Regen Network is a start-up: Ambition to create a platform where land owners can monetise and sell the environmental or ecosystem services to buyers around the world