

→ THE ESA EARTH OBSERVATION Φ -WEEK

EO Open Science and FutureEO

12–16 November 2018 | ESA–ESRIN | Frascati (Rome), Italy

NGOs and Satellite Imagery

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What I'll Cover Today



- **Background**
- **Blockchain Utility**
- **Project Focus**
- **What We Built**
- **Looking forward**



ConsenSys Vision

ConsenSys is assembling the tools needed to build and scale a world where decentralized platforms and the Ethereum world computer enable a new class of frictionless, global commerce with inclusion for all.

Our Core Business Model is Venture Creation

ConsenSys is the leading creator of new Blockchain ventures, consortia and alliances globally. ConsenSys participates in the funding, development and equity of these platforms, including co-creations with enterprise partners.

70+

Venture Creations and Consortia

Innovation is in our DNA. Unlike large enterprise services vendors we have the agility, creativity and top end engineering skills to deliver platforms.



- Our global team is composed of thought leaders from large-scale enterprise organizations including BCG, Booz Allen, Capgemini, Deloitte, IBM, McKinsey, Microsoft, Oracle, US Gov
- Investment analysis
- Platform design
- Competitive strategy
- Design thinking
- Brand creation + Go-to-market

Select Strategic Clients



Enterprise Platforms



External Investments

CONSENSYS
VENTURES

12 External
Investments

Consortium Creations



Enterprise
Ethereum
Alliance



Decentralized
Identity
Foundation



Accounting
Blockchain
Coalition




























ConsenSys partnered with a consortium of 15 key industry leaders and leading bank institutions to create a network-based commodities trading platform

Platforms and Applications

Here is a sample of products, platforms and ventures created by innovators and entrepreneurs around the world using ConsenSys tools, capital and resources. It reflects the disruptive potential of ethereum for Citi and your customers and suppliers.

// BLOCKCHAIN PLATFORMS & APPLICATIONS

 GNOSIS A prediction markets as a service platform that can be used for various domains from sports to celebrity news. Gnosis.pm	 VIAIT A platform for modeling business processes, tracking assets and building supply chains of the future. Viant.io	 GRID+ Leverages the public Ethereum blockchain to give consumers direct access to wholesale energy markets. Gridplus.io	 AIRSWAP A platform that makes it easy to find, price, and trade tokens peer-to-peer on the Ethereum blockchain. Airswap.io	 TRUSET A decentralized marketplace to crowdsource the collection, cleansing, and distribution of capital markets reference data. Truset.com
 UJO A digital rights management platform enabling fairness, transparency and profitability in music and creative works. Ujomusic.com	 BALANC3 An accounting platform that monitors onchain transactions and tokens for financial reporting and compliance. Balanc3.net	 VIRTUE POKER A peer-to-peer community poker platform built on trust, transparency and provably fair gaming. Virtue.poker	 OMEGA ONE A decentralized, automated trade execution platform making crypto trading cheap and safe. Omega.one	 FATHOM A decentralized peer assessment protocol forming the foundation of a universal academic system. Fathom.network
 GITCOIN Scales open source projects using incentivization methods to crowdsource tasks, recruit talent and improve projects. Gitcoin.co	 KAURI A decentralized technical support network to serve developers at all levels and organizations. Kauri.io	 BENEFACTORY A community platform for proposing and crowdfunding public goods that contribute to their mission. Benefactory.cc	 CIVIL A platform for sustainable and trustworthy journalism using open governance and cryptoeconomics. Joincivil.com	 BOUNTIES NETWORK Freelance task fulfillment, paying out in any Ethereum token upon successful completion. Bounties.network
 VARIABLE A secure, efficient derivatives trading platform on Ethereum that matches traders in secure zero-sum smart contracts. Variabl.io	 LINNIA A platform for consumers to store and permission access to their longitudinal health data in order to live their best life. Linnia	 Open Law A blockchain-based protocol for the creation and execution of legal agreements in a user-friendly, compliant way. Openlaw.io	 CELLARIUS A transmedia storytelling franchise for users to create a collaborative, fan-curated universe on blockchain. Cellarius.network	 PANGEA A blockchain platform for shared property ownership, for investing in a simple and accessible way. Pangea.io
 TRUSTOLOGY A custody platform to safe guard crypto assets, with customizable smart accounts for diverse client needs. Trustology.io	 CONSCIENCE A scientific research, peer review and publishing platform that is transparent and auditable. Conscience.network	 FRONTIER A decentralized token research analyst platform curated and incentivized by governance tokens. FrontierTokenResearch.com	 LOCALTIES A loyalty network uniting independent merchants to their customers to incentivize spending in the local economy. Localties.io	 GOVERNX A governance platform for creating and managing complex decentralized and distributed organizations. Boardroom.io

What is a blockchain?

Originally conceived as the underlying protocol of Bitcoin, blockchain technology has since evolved to support a number of applications with the introduction of "smart contracts" in Ethereum

Immutable ledger

Write-once database that records an immutable record of every transaction



Decentralized

Many replicas of the blockchain database where consensus among majority participants is needed to make updates



Smart contracts

The Ethereum blockchain can store both data and Smart Contract ("logic") in the blockchain



Cryptographically Secure

Public/ private cryptography signature technology to create transactions that are impervious to fraud and establishes a shared truth



What is Ethereum

"Think of Ethereum as a world computer. What Bitcoin does for payments, Ethereum does for anything that can be programmed."

-Vitalik Buterin, Ethereum Inventor



Formally specified security and smart contract capabilities



Vendor-neutral



Public – private blockchains compatibility



Private, permissioned blockchains for enterprise and government use cases



Rapidly growing community encompassing 120,000+ developers



Multi-billion dollars of value protected on the public network



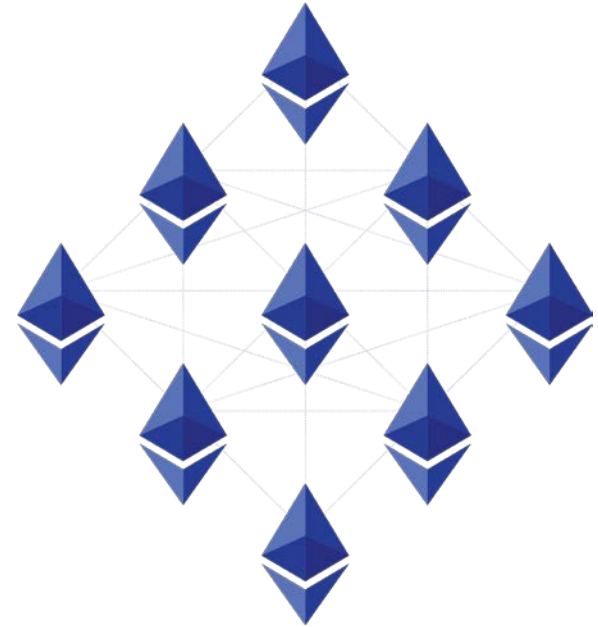
Enterprise Ethereum Alliance (EEA) is growing faster than all other blockchain consortia



The dominant platform for the 'token ecosystem'

The Ethereum blockchain creates an open and distributed ledgers reflecting computational state across many nodes

- Stored and replicated across nodes (no single point of failure)
- “Smart contracts” automate business logic
- Transactions and state changes are added to an immutable ledger that is tamper-proof
- Asset transfers are more secure, faster, and easier



Blockchain enablers

Key patterns enabling blockchain-based disruption



Digital
identity



Real-time
transactions



Asset
tokenization



Custody
& escrow



Micro
payments
& funding



Provenance
& tracking



Accounting &
reconciliation



Global
reference data



Radiant Earth Foundation

EARTH IMAGERY FOR IMPACT



Use Cases: Post-Hurricane Vegetation Analysis



Dominica (15.30, -61.37)



Date of Hurrigan Landfall: 2017-09-18

Maria in Dominica

The images on the map are captured before (09/15/2017) and after (09/23/2017) the Hurrigan Maria hit Dominica.

Puerto Rico - Arecibo (18.41, -66.70)

Date of Hurrigan Landfall: 2017-09-20

Maria in Dominica

Puerto Rico - San Juan (18.40, -61.15)

Date of Hurrigan Landfall: 2017-09-20

Maria in Dominica

Bahamas (22.72, -74.19)

Date of Hurrigan Landfall: 2017-09-12

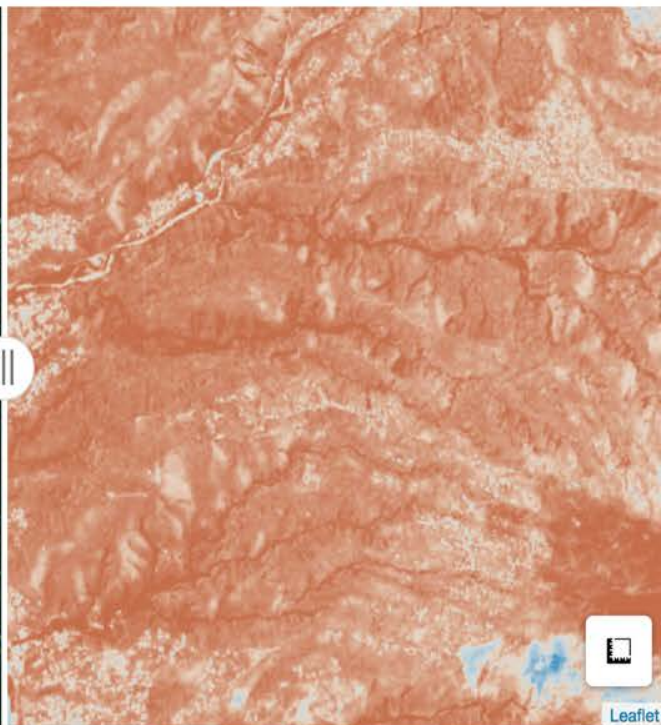
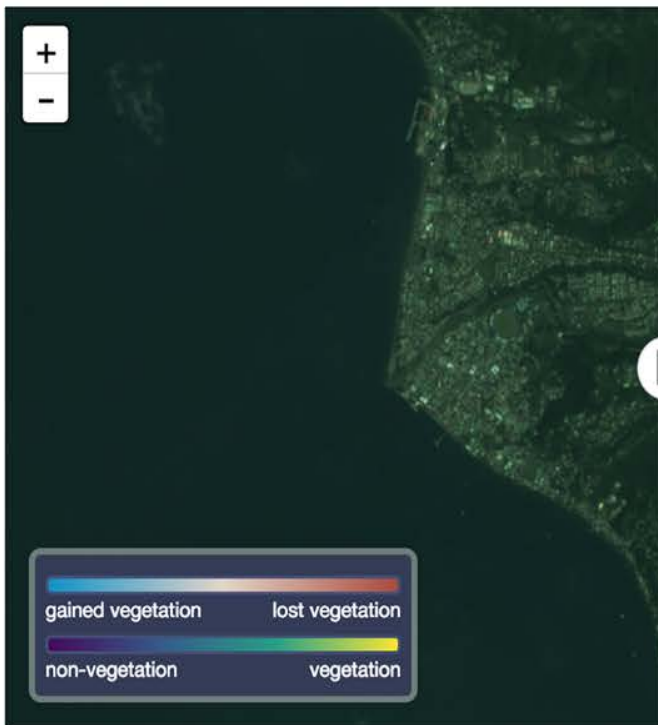
Irma in Bahamas

[Learn more](#)

Natural color (before) ⌵

Hurricane Impact - Veg. Cover (Caribbean - Sep 2017)

NDVI Change (after) ⌵



1. NGOs could collaborate better



2. EO data and tools could be less siloed and more equitable



This requires more trust!



The world's first blockchain



Credit: Pergamonmuseum - Berlin

A Shared Source of Truth

- Publicly referenceable source of objective data
- Literal 'proof-of-work'
- State of data updates overtime
- When society agrees on one simple thing we do many things better



Credit: Pergamonmuseum - Berlin



Solving Problem #1



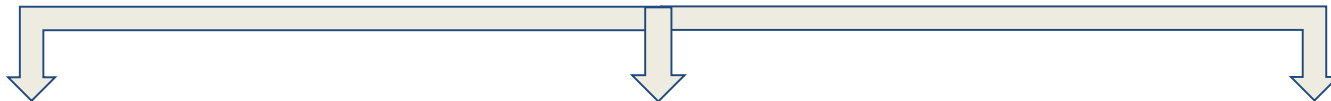
Our Proof of Concept

- In partnership with Radiant.Earth, we built an application that:
 - Standardized the ownership and licensed status of commercial images and hashed that metadata on the blockchain
 - Integrated with TechSoup Global's API and made NGO status widely referenceable by distributing it across all nodes
 - Recorded all data access on Radiant's platform to a shared Ethereum ledger
 - Minted a native token to incentivize end-user behavior

Solving Problem #2



NGO



Data Access Platform 1

Data Access Platform 2

Data Access Platform 3

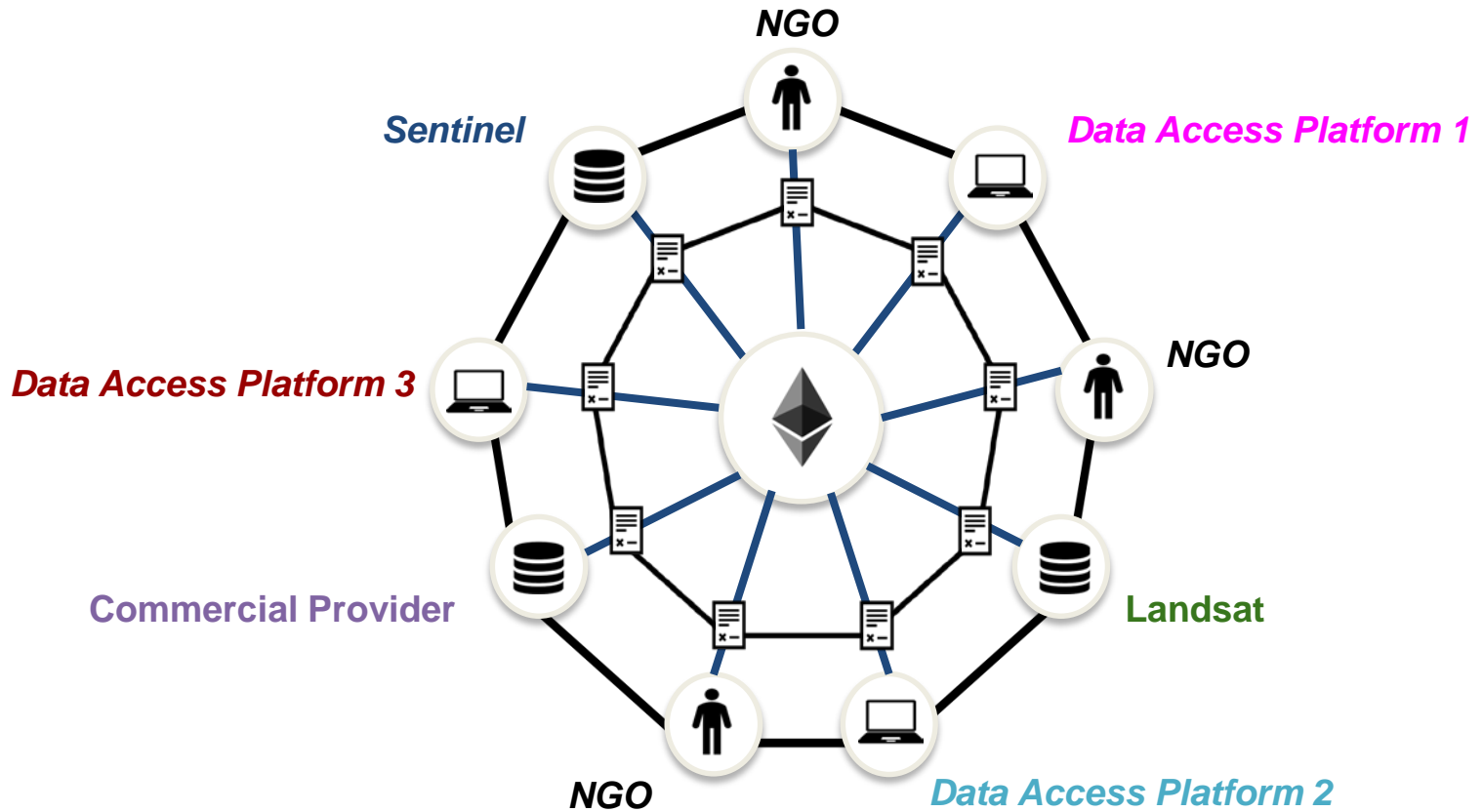


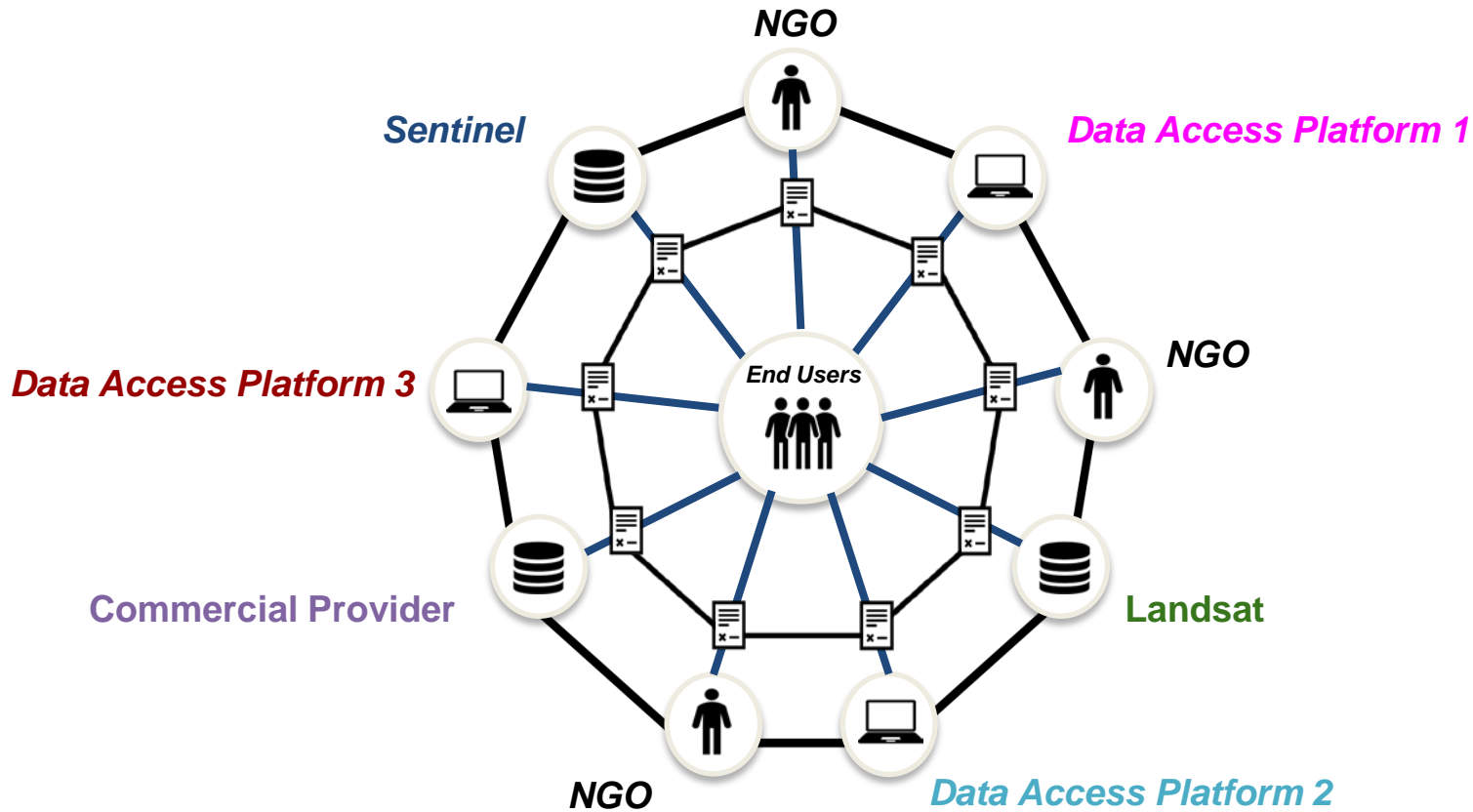
Sentinel

Commercial
Provider

Landsat







Looking forward

- Expand to multiple platforms and more users
- Create a transparent network of data providers and analysis platforms for NGOs
- Further distribute trust across data production and consumption
- Use this as a testing ground to ultimately create an open data sharing ecosystem for all potential end-users and providers
- Integrate marketplace features

Where blockchains make sense

- 1. Systems must require a shared source of data**
- 1. Data has multiple 3rd parties that find value in updating it**
- 1. One party cannot control the totality of this data**
- 1. Transactions interact with this data**
- 1. Enforceable**

Contact

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