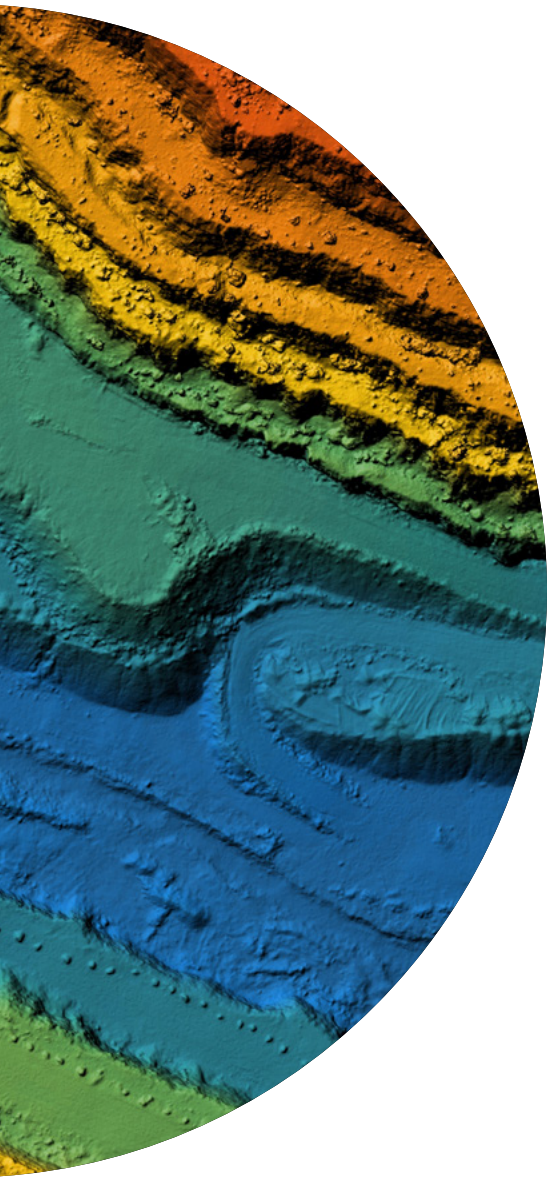
## OPPORTUNITY #19

What if we built a digital climate catalogue?



# THE ULTIMATE CLIMATE CALCULATOR

Going beyond the carbon footprint, a digital climate catalogue allows governments, businesses and even individuals to calculate their environmental impact in real time. Fully automated, this valuation system reveals the likely impacts of potential policy and investment choices.

**MEGATREND**
Saving Ecosystems

**TRENDS**
Artificial Intelligence
ESG & Beyond GDP
Internet of Things (IoT)
Net-zero

**SECTORS AFFECTED**
Agriculture & Food
Communication Technologies & Systems
Consumer Goods, Services & Retail
Cyber & Information Security
Data Science, AI & Machine Learning
Education
Energy, Oil & Gas, & Renewables
Financial Services & Investment
Health & Healthcare
Insurance & Reinsurance
Logistics, Shipping & Freight
Manufacturing
Metals & Mining

## WHY IT MATTERS TODAY

Climate change will affect all areas of life, and the consequences of inaction are well documented. For example, some species face extinction with every degree of increase in temperature, and severe water shortages could lead to the displacement of 700 million people globally by 2030.[394] The Middle East and North Africa (MENA) region is one of the driest in the world, with 12 of the most water-scarce countries located in the region.[395]

Approaches to assigning an economic value to nature vary, based on context, theoretical perspective and approach to uncertainty and complexity.[396][397] Back in 1997, researchers defined 17 categories for ecosystems – ranging from gas and water regulation to pollination, waste treatment, recreation and food production – and estimated the value of the entire biosphere to be an average of $33 trillion per year.[398] In 2011, the value of earth was estimated at $5 quadrillion (quadrillion = a million billion).[399] In 2022, it was estimated that every dollar invested in the restoration of degraded land yields $7–$30 in returns from job creation and carbon capture.[400]

Climate change also threatens health as projections reveal 250,000 additional deaths will occur annually between 2030 and 2050 due to climate-sensitive diseases such as heat stress, malnutrition, dengue, malaria and diarrhoea. This will initially cost societies up to $4 billion annually, with the amount likely to increase in the future.[401]

Mostly in North America, and capturing more than 45 million tonnes (Mt) of carbon dioxide per year particularly through natural gas processing plants,[402] the global carbon-capture and storage market was valued at just over $3 billion in 2021.[403] With aspirational climate targets and associated government and non-government incentives, the market is expected to grow to a $55 billion per year market by 2030.[404]

Carbon markets are in an early stage of development in some major Gulf Cooperation Council (GCC) countries. The United Arab Emirates and Saudi Arabia have committed to achieving net zero emissions by 2050 and 2060 respectively.[405]

The Internet of Things (IoT) holds much promise when it comes to the environment and the possibilities for linking technology to a catalogue of earth's data. The technology is already applied to monitoring livestock,[406] water quality in fishponds[407] and environmental compliance.[408] Globally, the number of IoT connections grew by 8% in 2021, reaching 12 billion points. By 2025, 27 billion connected IoT devices are expected to be active.[409]

## THE OPPORTUNITY

The capacity to build more accurate predictive models allows for the building of a digital whole-earth catalogue that would be able to demonstrate how decisions would affect the environment immediately and over time. IoT and advanced machine intelligence could be employed to build more accurate models and reports using data inputs from ultra-high-definition satellite imagery, atmospheric and bioacoustics (animal and marine life sounds) sensors and DNA technologies (to track soil and insect health). All of this data would feed into a self-updating global model of human–environment interaction resembling an ecological digital twin.

Businesses, governments and communities could forecast the effects of their infrastructure usage, upcoming projects or changes to their operations or supply chains in terms of their impact on local and global ecosystems. Going beyond the carbon footprint,[410] the digital whole-earth catalogue would capture changes in the value and flows of natural assets. It would calculate – in real time – the costs, benefits and economic impacts of investments and behaviours affecting air quality, greenhouse gas emissions, water and biodiversity. This would enable efforts to go beyond economic growth and address climate risk.[411]

## BENEFITS

The possibility of comparable measurements through a common metric and model(s) available to all. Potential to reveal new sources of value and revenue streams.

## RISKS

Undervaluation or overvaluation of certain forms of capital in relation to climate impact. Incorrect picture of progress through distorted metrics.

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