

Earth Knowledge  
Foresight & Insight Services

# Challenge: Transform Decision-Making to Build a More Sustainable World, Mitigating Financial Risk & Harnessing Opportunities

**Global ESG assets are on track to exceed \$53T by 2025**, representing more than a third of total AUM. (Bloomberg). **Yet there is a** perceived lack of reliable, authoritative data upon which to make the best investment decisions.

**\$44 trillion of economic value generation** – over half the world's total GDP – is moderately or highly dependent on nature and its services. Nature loss is a planetary emergency. Humanity has already wiped out 83% of wild mammals and half of all plants and severely altered three-quarters of ice-free land and two-thirds of marine environments.

**“Climate risk is investment risk.” (BlackRock)** Investors are demanding that corporations reveal their climate and environmental risks.

**ESG (Environmental, Social and Governance)** ratings have depended on what the companies say that they are doing rather than more accurate methodology such as in-depth risk analysis of company physical assets and supply chains by location which can highlight climate, nature and social financial risks.

**Financial Regulations** for Climate Risk and Environment, Social and Governance (**ESG**) are going mainstream.... and soon Nature-related Financial Risk Regulations.

**Authoritative, Reliable Data is Critical** for investors and companies as to what truly is sustainable, climate resilient and nature positive to unlock trillions of dollars of investment and protect our enormously valuable asset: our planet.

Financial markets represent  
what is happening  
in the economy.

We are the essential eyes and ears  
that help you see full contrast  
in an ever-changing world.

Earth data is beyond ESG.  
It's the foundation that brings full clarity  
to economic risk and your investment decisions.





See the world as you've never seen it before.

Our living scientific data network brings clarity to your business and investment decisions.

Understand your sustainability, operational and economic risk through forward-thinking intelligence grounded by historical and current global data patterns.

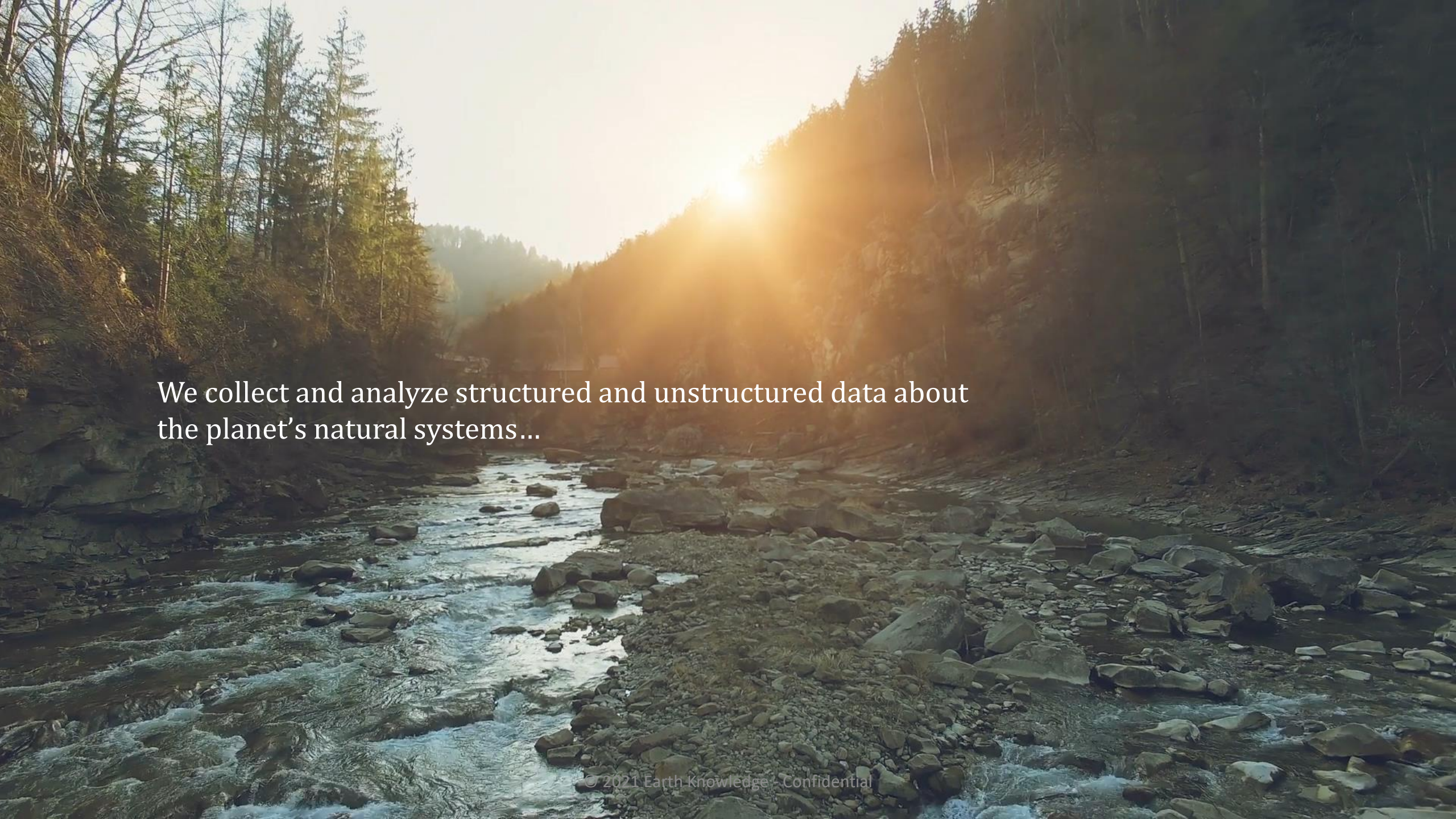
## **EK Solution Integrated Planetary Intelligence:**

The Earth is comprised of systems of systems.

**We are building a digital twin of the earth, tracking global changes of these systems and the interaction of these systems: from subsurface to atmosphere.**


For any location on the globe, EK provides you the understanding the earth systems and global change interactions to make the very best decisions.





We collect and analyze structured and unstructured data about the planet's natural systems...



A herd of reindeer is shown in a snowy, mountainous landscape. The reindeer are in various poses, some standing and some partially obscured by the snow. The scene is captured in a soft, slightly desaturated light, emphasizing the texture of the snow and the forms of the animals.

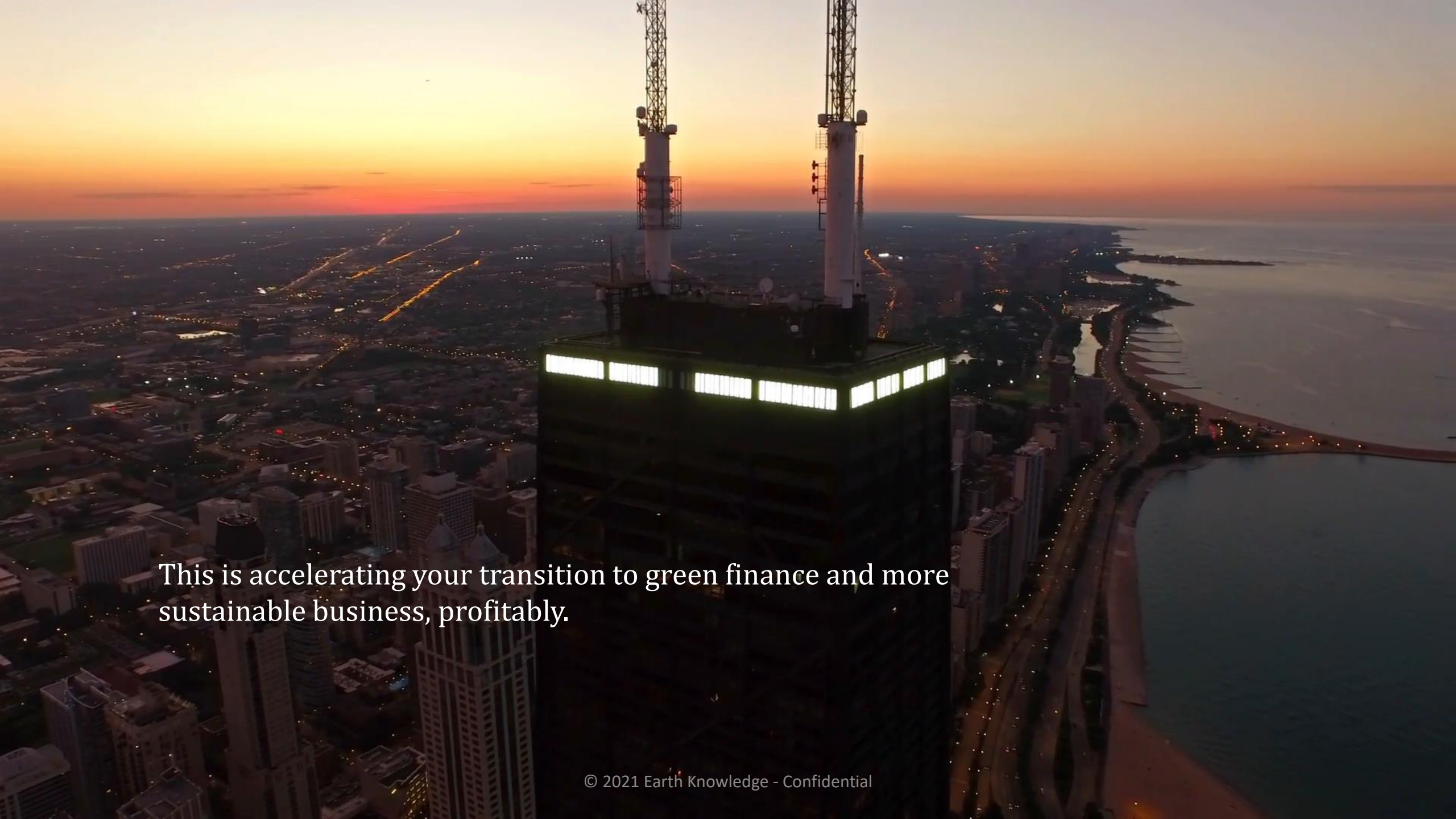
We see the interconnected patterns in the way our planet is changing like nobody else can and use this to bring comprehensive context to your decision-making.





Our Earth Knowledge Indicators aggregate decades' worth of planetary data in a single platform to highlight key metrics and flag risks and opportunities you may not have considered to give you the bigger picture.





This is accelerating your transition to green finance and more sustainable business, profitably.

We bring together a global team of Nobel Laureates, expert scientists, analysts and leading organizations to collect complex, multi-dimensional, non-linear planetary and environmental data.

Combined with analytics at scale, we see and understand the high interconnectivity between the planet's natural systems and the modern world, and the interacting facets of sustainability and global change.

All the data we collect is peer-reviewed and verified by specialists in their field. We then apply this information to build accurate models that help you measure and mitigate risk.

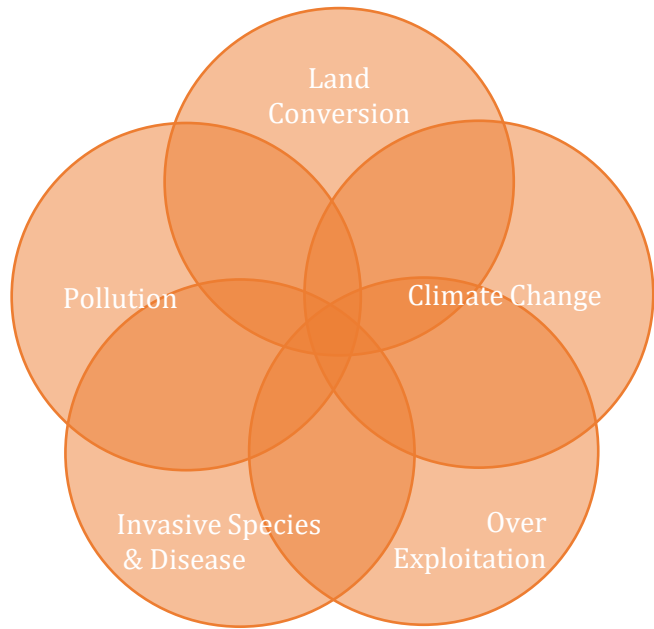
This isn't simply aggregating data.

**This is Business Resilience built on Science.**





**Living  
Scientific  
Network**



**Earth Knowledge  
Indicators**



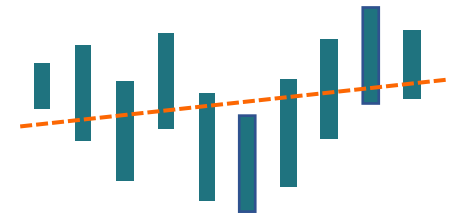
300 Global Change &  
Sustainability Indicators

Sustainability Risk

Operational Risk

Economic Risk

**Better  
Financial  
Performance**



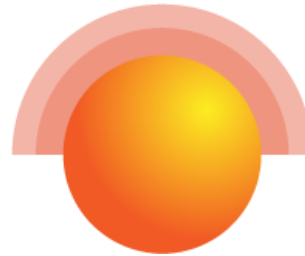
**Step change in  
Risk forecasting  
& mitigation**

# Earth Knowledge Planetary Intelligence Platform & Expert Services



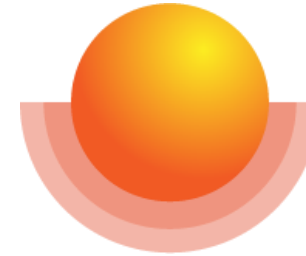
## Indicators

More than 300 Global Change and Sustainability Indicators provide an in-depth understanding of our Earth systems, and the risks and opportunities they provide. Drill through layers of data to access deeper, more detailed insights and analysis covering any location across the globe.



## Foresight

PaaS-based forward-looking intelligence developed from Earth systems models deliver historical, current, and future data, covering any location worldwide.



## Insight Services

Insight Services help you maximize the use of our Planetary Intelligence Platform. Work with our team of global experts to determine your needs, key locations and gain detailed insights specific to your investment and company developments.



## **Earth Knowledge Insight Services**

**Earth Knowledge advises at the Board & Management Levels** to help make transformational shifts to improve investments and operations, propelling Earth Knowledge Platform subscription sales.

**Nobel Laureate and Experts to supplement Earth Knowledge Foresight** when specific industry, global change risk or geographical expertise is needed. There is so much complexity to the human-planet interactions and resulting financial risks, that to make the best decisions requires EK Networks' talented experts' advice.

**Provide Data Science or Analytics Implementation Support** that can include Geospatial Data Implementation, Customized Data Analytics, and/or Customized User Interface / User Experience.

## **Caliber of Earth Knowledge Team, Network and Indicators**

### **Earth Knowledge Climate Director**

- **Dr. Don Wuebbles**
  - IPCC Author Shares Nobel Peace Prize with Al Gore
  - Obama White House Assistant Director
  - Advising President Biden
  - Expert in Climate Model Downscaling
  - NOAA Science Advisory Board



**Earth Knowledge  
Foresight  
Indicators  
ESG, Climate Risk  
and  
Sustainable Finance**



“

\$37.3m

invested in managing water  
for a growing economy...

...we found hidden leakage  
and designed underground wells  
to mitigate the devastating economic  
and community risks.





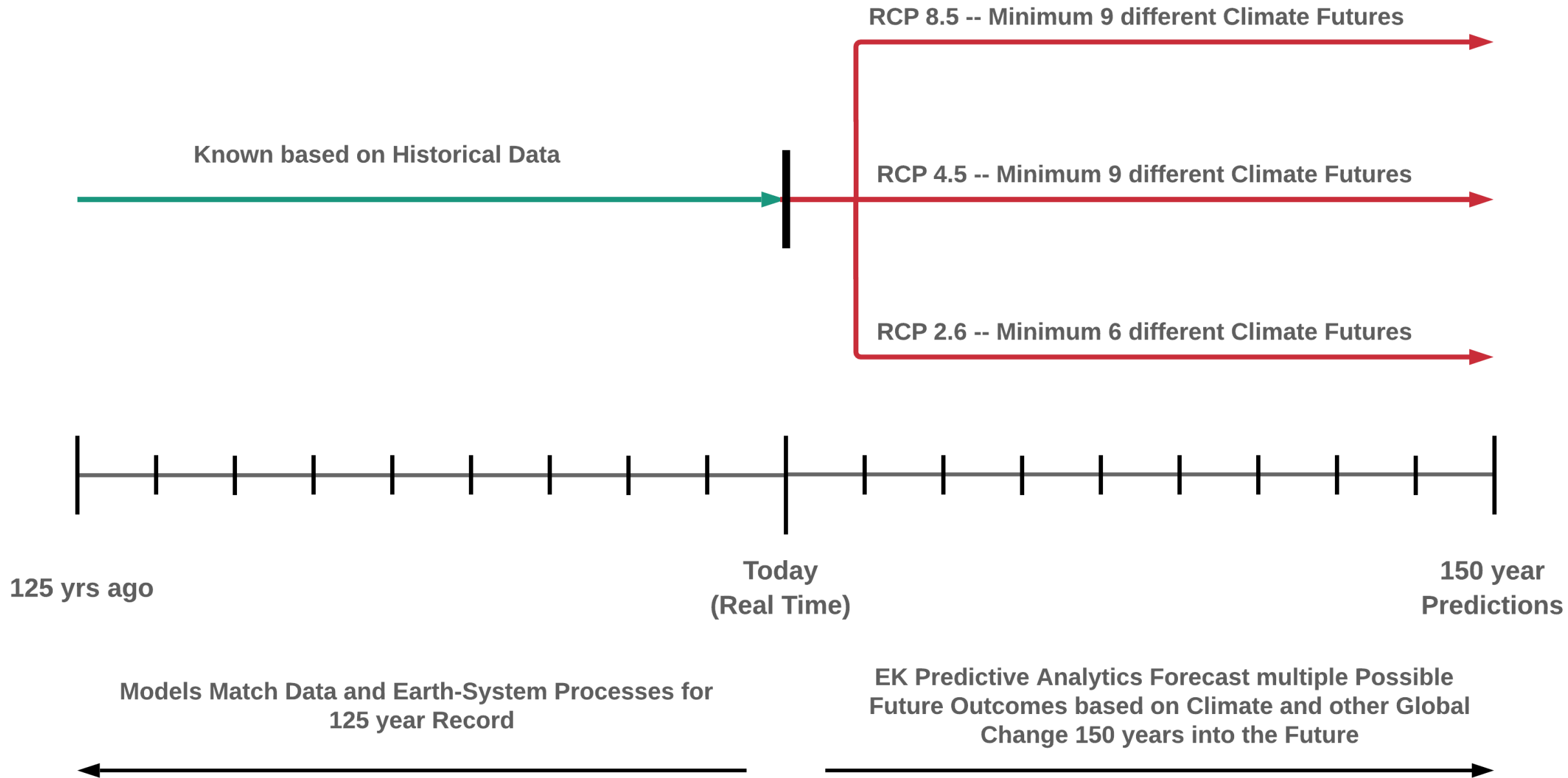
Our  
afternoon  
sanctuary...

...we predicted  
raging fire devastation,  
putting countless homes at risk.



# Earth Knowledge Planetary Intelligence Platform is Location Based

- All data, models, insights, and risks are directly tied to geographic location and time
  - Deployed using Esri “Intelligent Geospatial Infrastructure”
  - Global coverage at:
    - 5 km, 1 km, 250 m, and 50 m resolutions
    - Monthly, Annually, Decadal, and 30-yr time intervals
    - Special cases for Quarterly, Seasonal and Daily
  - Open data (often isolated data sources) are aggregated and integrated to create consistent data.
  - Global climate data (CMIP) is statistically/dynamically downscaled
  - Biophysical processes are calculated at each model cell; outputs included 1000’s of parameters and variables
  - Probability, Magnitude, and Duration of hazard calculated for every model cell and time interval



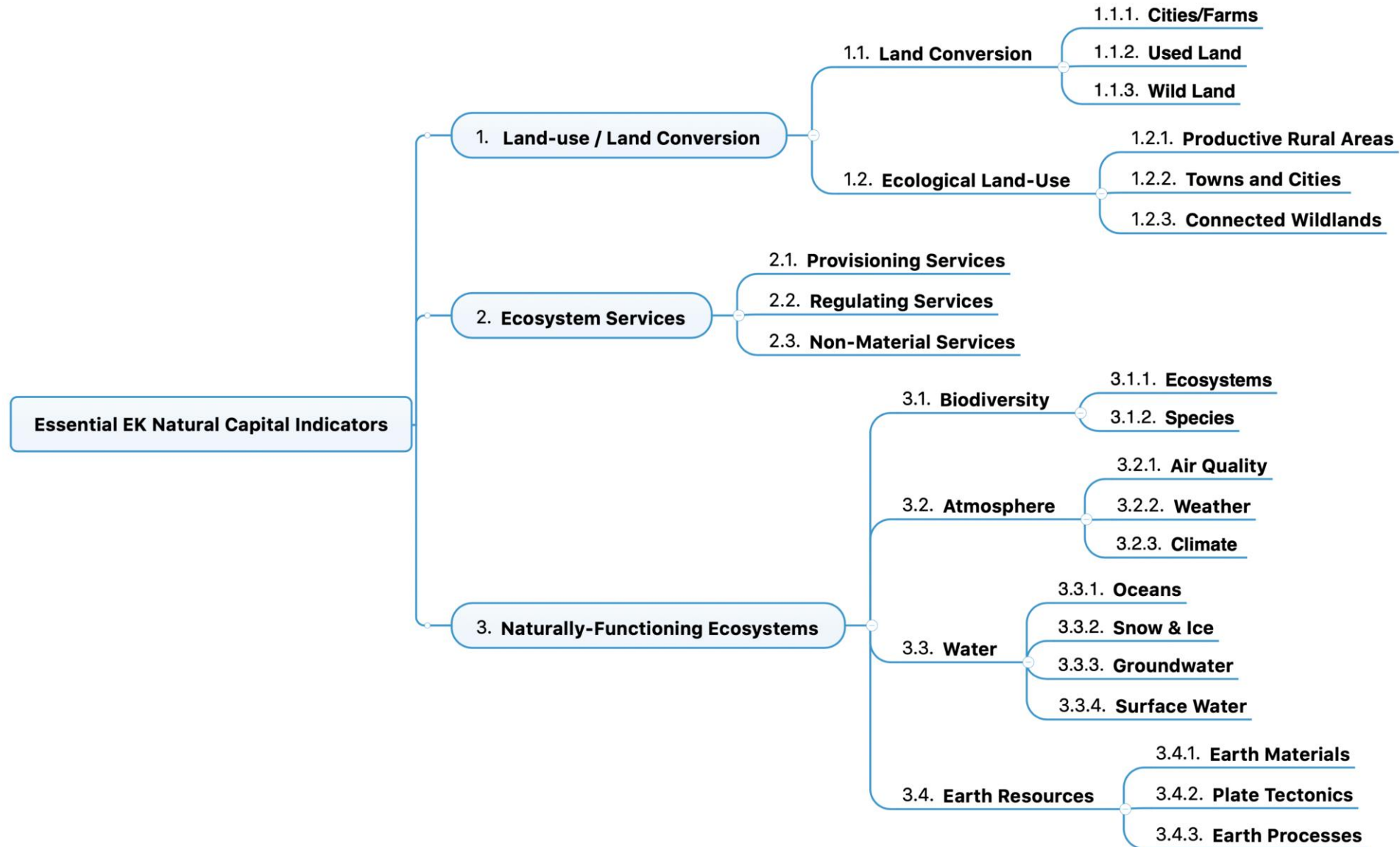
## **Earth Knowledge Indicators: Earth Cube to Spreadsheet**

Measurable, Quantifiable Investment and Operations  
Risks and Opportunities related to Global Change and  
Sustainability at any location on the globe.

Providing Hazard Scores: Magnitude, Severity and Duration



# Essential Earth Knowledge Natural Capital Indicators



## Assets Loaded

[Review and Filter](#)

**844**

Assets

**13**

Companies

**5**

Sectors (SASB)

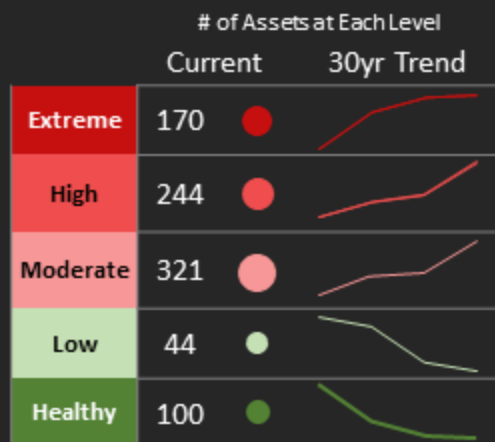
[Settings](#)

Projection:  
RCP2.6

Highlighting:  
High, Extreme

## Level-of-Hazard Profile for Your Assets

Counts Assets according to the greatest level of hazard for that Asset.

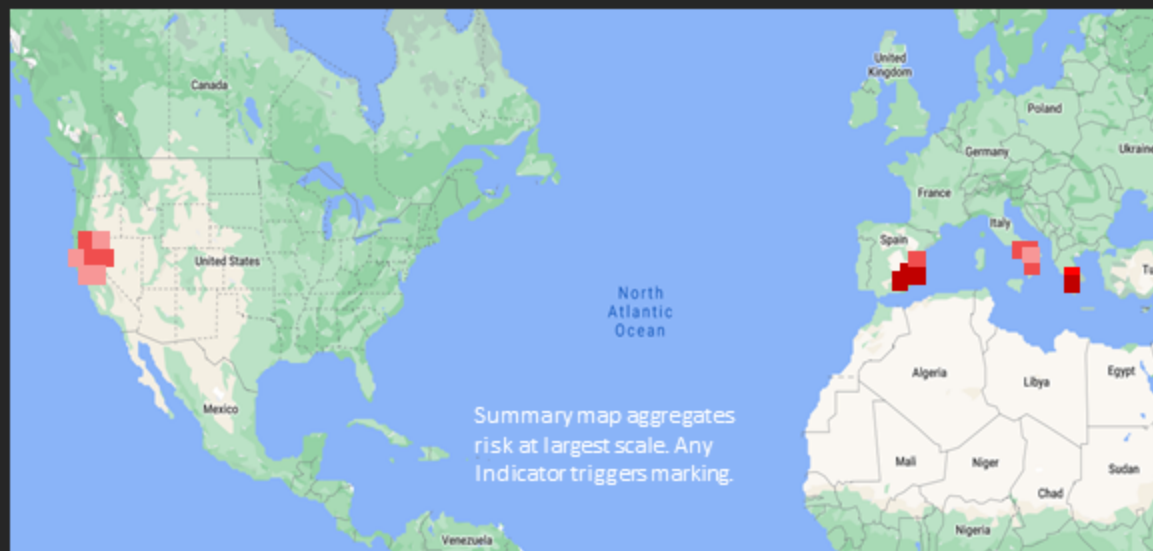


## Primary Sources of Hazard

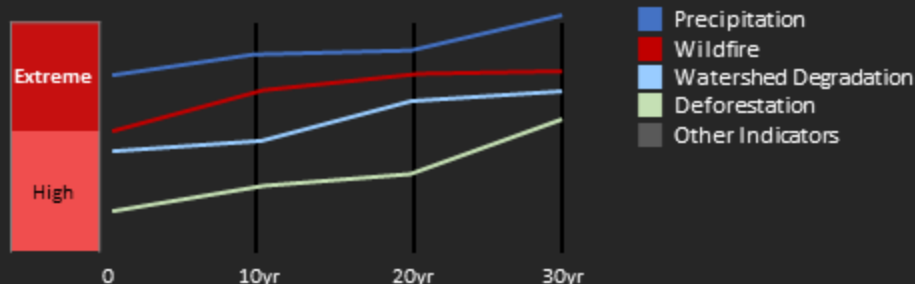


- Precipitation
- Wildfire
- Watershed Degradation
- Deforestation
- Other Indicators

## Assets with Hazard Levels that are High or Extreme



## Trends in Primary Sources of Hazard Over 30yr



## Highlighted Assets, Companies and Sources of Hazard

[Show All](#)

Sector	Assets	Company	#	Hazard Level	Source Indicators	5yr Forecast	30yr Forecast
TC-TL	Cellular Towers	CP Cellular (USA)	140	Extreme	Precip., Wildfire, Watershed Deg	↑ 2.7%	↑ 8.1%
FB-AB	Agricultural Land, Retail Outlet, Manufacturing	Espana Estates (ESP)	33	Extreme	Precip., Watershed Deg, Agricultural Intens.	↑ 3.7%	↑ 12.1%
FB-AB	Agricultural Land, Manufacturing	Gemelli Wine Co. (USA)	12	Extreme	Precip., Watershed Deg, Agricultural Intens.	↑ .09%	↑ 9.1%
RR-PP	Forest Lot, Lumber Mill	Hauser Wood Products (USA)	44	Extreme	Precip., Deforestation, Watershed Degradation	↑ 3.1%	↑ 6.8%
IF-EU	Electrical Network	Pacific Coastal Energy (USA)	677	Extreme	Precip., Wildfire, Urbanization	↑ 0.7%	↑ 2.1%

View Full Highlight Table ▶  
to select Assets

Assets	Comp	#	Ex	Hazard Source	5yr
Cellular	CP Cellular	1	Ext	Precipitation,	↑
Power Plants	Costa del	2	Ext	Wildfire, Precipitation	↑

## Selected Assets

140

Cell Towers

Company  
CP Cellular

### Hazard Sources

- Precipitation
- Watershed Degradation
- Wildfire

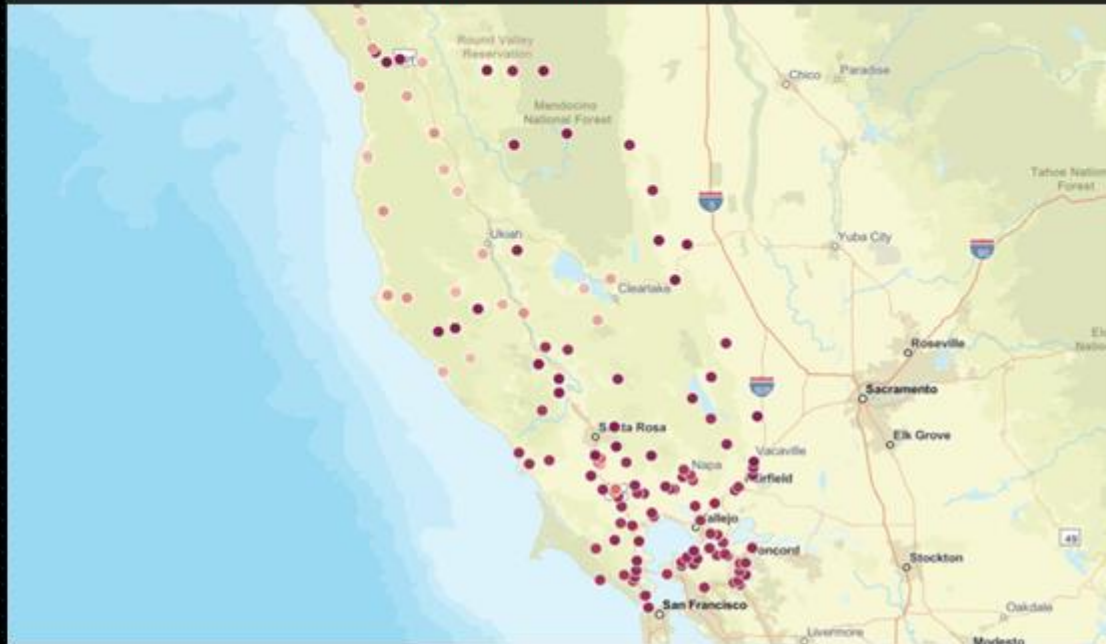
### Primary Hazard

- Components
- Probability
- Duration

### Hazard Levels Selected

- Extreme
- High
- Moderate
- Low
- Healthy

Locations of Selected Assets



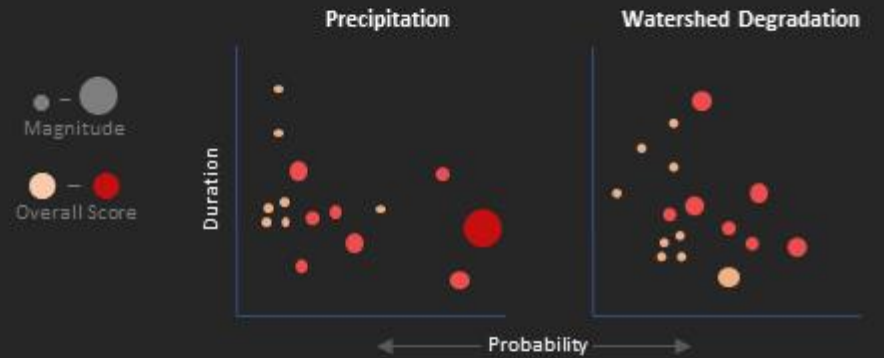
Company	Agricultural Intensification	Deforestation	Desertification	Oceans and Coasts	Precipitation	Surface Water	Temperature	Urbanization	Watershed Degradation	Wildfire	Wind
TTD Wireless Holdings	0.72 ▲	0.70 ▲	0.01 ●	0.45 ▲	0.95 ◆	0.58 ▲	0.44 ▲	0.57 ▲	0.84 ◆	0.87 ◆	0.36 ▲
Sing Cell	0.71 ▲	0.70 ▲	0.01 ●	0.45 ▲	0.95 ◆	0.58 ▲	0.44 ▲	0.57 ▲	0.73 ▲	0.91 ◆	0.36 ▲
ETG Mobile	0.69 ▲	0.68 ▲	0.02 ●	0.45 ▲	0.95 ◆	0.59 ▲	0.44 ▲	0.59 ▲	0.77 ◆	0.88 ◆	0.36 ▲
Valley Mobile	0.55 ▲	0.62 ▲	0.01 ●	0.45 ▲	0.94 ◆	0.58 ▲	0.60 ▲	0.60 ▲	0.75 ▲	0.82 ◆	0.36 ▲
CP Cellular	0.29 ●	0.49 ▲	0.02 ●	0.45 ▲	0.93 ◆	0.56 ▲	0.49 ▲	0.65 ▲	0.83 ◆	0.43 ◆	0.36 ▲
Cellular tower 123	0.72 ▲	0.70 ▲	0.01 ●	0.45 ▲	0.95 ◆	0.63 ▲	0.68 ▲	0.68 ▲	0.51 ▲	1.00 ◆	0.36 ▲
Cellular tower 17	0.17 ●	0.43 ▲	0.01 ●	0.45 ▲	0.92 ◆	0.54 ▲	0.44 ▲	0.58 ▲	0.88 ◆	0.44 ◆	0.36 ▲
Cellular tower 21	0.18 ●	0.43 ▲	0.02 ●	0.45 ▲	0.93 ◆	0.54 ▲	0.45 ▲	0.52 ▲	0.72 ▲	0.43 ◆	0.36 ▲
Cellular tower 4	0.17 ●	0.42 ▲	0.02 ●	0.45 ▲	0.92 ◆	0.53 ▲	0.44 ▲	0.64 ▲	0.92 ◆	0.32 ●	0.36 ▲
Cellular tower 1	0.19 ●	0.43 ▲	0.01 ●	0.45 ▲	0.92 ◆	0.54 ▲	0.44 ▲	0.70 ▲	0.95 ◆	0.21 ●	0.37 ▲
Cellular tower 6	0.17 ●	0.43 ▲	0.02 ●	0.45 ▲	0.92 ◆	0.53 ▲	0.44 ▲	0.70 ▲	0.96 ◆	0.22 ●	0.36 ▲
Cellular tower 5	0.16 ●	0.44 ▲	0.02 ●	0.45 ▲	0.92 ◆	0.54 ▲	0.44 ▲	0.70 ▲	0.95 ◆	0.22 ●	0.37 ▲
Cellular tower 2	0.17 ●	0.44 ▲	0.02 ●	0.44 ▲	0.92 ◆	0.54 ▲	0.45 ▲	0.70 ▲	0.96 ◆	0.21 ●	0.36 ▲
Cellular tower 9	0.17 ●	0.43 ▲	0.02 ●	0.45 ▲	0.93 ◆	0.54 ▲	0.44 ▲	0.70 ▲	0.95 ◆	0.22 ●	0.36 ▲
Cellular tower 11	0.18 ●	0.44 ▲	0.02 ●	0.44 ▲	0.92 ◆	0.54 ▲	0.45 ▲	0.53 ▲	0.90 ◆	0.22 ●	0.35 ▲
CAL Cell	0.18 ●	0.43 ▲	0.02 ●	0.45 ▲	0.92 ◆	0.54 ▲	0.44 ▲	0.63 ▲	0.80 ◆	0.49 ◆	0.36 ▲

Greatest Hazard Sources  
Select 2 Indicators to Display in  
Components and Projections below.

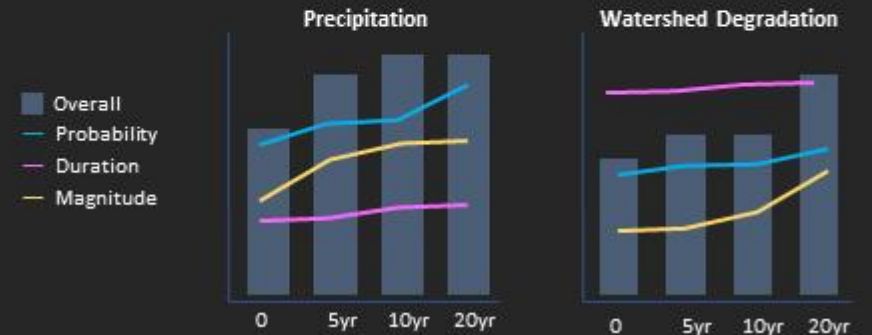
Precipitation  
Watershed Degradation  
Wildfire  
...Show All ↗

## Hazard Components for Each Asset

Probability | Duration | Magnitude

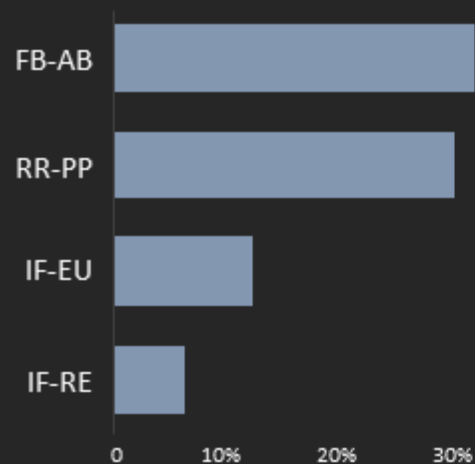


## Hazard Components Projections





Percentage of Assets with High or Extreme Hazard Levels



FB-AB

# of Assets at Each Level  
Current 30yr Trend

Extreme	180	
High	144	
Moderate	25	
Low	2	
Healthy	1	



- Watershed Degradation
- Agricultural Intensifica...
- Urbanization
- Wildfire
- Other Indicators

RR-PP

# of Assets at Each Level  
Current 30yr Trend

Extreme	75	
High	129	
Moderate	131	
Low	11	
Healthy	22	



- Wildfire
- Deforestation
- Watershed Degradation
- Precipitation
- Other Indicators

IF-EU

# of Assets at Each Level  
Current 30yr Trend

Extreme	12	
High	31	
Moderate	72	
Low	44	
Healthy	22	



- Precipitation
- Wildfire
- Deforestation
- Surface Water
- Other Indicators

IF-RE

# of Assets at Each Level  
Current 30yr Trend

Extreme	20	
High	42	
Moderate	83	
Low	144	
Healthy	113	



- Wildfire
- Precipitation
- Surface Water
- Temperature
- Other Indicators



Thank you.

[info@earthknowledge.net](mailto:info@earthknowledge.net)