MARKET EFFICIENCY AND INNOVATION

The Climate-Nature Nexus

An investor guide to expanding from climate- to nature-data

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UN environment programme WCMC

FINANCE FOR BIODIVERSITY Initiative

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About UN environment programme WCMC

The UN Environment Programme World Conservation Monitoring Centre (UNEP-WCMC) is a global centre of excellence on biodiversity and nature's contribution to society and the economy. It operates as a collaboration between the United Nations Environment Programme and UK charity WCMC.

UNEP-WCMC works at the interface of science, policy and practice to tackle the global crisis facing nature and support the transition to a sustainable future for people and the planet.

Our mission is to develop knowledge and capacity for a nature-positive world and our cutting-edge science, data and insights inform policy and business decisions worldwide.

Our work is organised across four areas of positive impact for nature, supported by our innovative activity in digital transformation, science and policy:

- **Nature Conserved:** working to ensure sustainability in the international trade in wildlife, promote nature connectivity and support governments and others to strengthen networks of protected and conserved areas
- **Nature Restored:** sharing knowledge and insights on the importance of restoring land and ocean ecosystems, as well as the opportunities to improve sustainability and resilience of agricultural systems
- **Nature-based Solutions:** strengthening the use of nature-based solutions to climate change and championing the dependence of human health on the health of the natural world
- **Nature Economy:** identifying leverage points to transform global economic systems, including through providing data platforms and metrics to help governments, businesses and investors understand impacts and dependencies on nature

Achieving the UN's vision of a world living in harmony with nature by 2050 requires transformative and systemic change across all sectors. UNEP-WCMC brings together and supports governments, businesses, research bodies, and more, to put nature at the heart of decision-making.

About FINANCE FOR BIODIVERSITY Initiative

F4B's goal is to increase the materiality of biodiversity in financial decision-making, and so better align global finance with environmental conservation and restoration.

Our work on market efficiency and innovation draws from the entirety of our portfolio, which is organised across five workstreams:

- **Market efficiency and innovation:** including a leadership role in the Taskforce on Nature-related Financial Disclosures (TNFD), and support to several data- and fintech-linked initiatives.
- **Enhanced liability:** extending the legal liabilities of financial institutions for biodiversity outcomes, including innovations such as legal personhood for nature.
- **Citizen engagement:** public advocacy, campaigning and advancing digital approaches to catalysing shifts in citizens' financing behaviour.
- **Public finance:** advancing measures and advocacy linked to stimulus and recovery spending, and the place of nature in sovereign debt markets.
- **Nature markets:** catalysing nature markets by developing new revenue streams and robust governance innovations.

F4B has been established with support from the MAVA Foundation, which has a mission to conserve biodiversity for the benefit of people and nature. F4B's work benefits from partnership with, and support from, the Children's Investment Fund Foundation (CIFF) and the Gordon and Betty Moore Foundation through The Finance Hub.

For more information and publications, visit www.F4B-initiative.net

The Climate-Nature Nexus

An investor guide to expanding from climate- to nature-data

Executive Summary

There is an urgent need for the finance sector to account for nature-related risks in decisions, building on progress in assessing and managing climate-related risks. This can help ensure portfolios are resilient to changes in the state of nature, thereby potentially reducing their volatility. "Nature-related risks" are the risks to an organisation from links between its activities and nature. This includes shorter-term financial risks as well as longer-term risks stemming from an organisation's impacts and dependencies on nature. While challenges remain in accessing ideal data, there are already relevant resources for financial institutions to use, including data currently used for assessments of climate risk. This investor guide presents three steps that financial institutions can follow to use existing tools and datasets to screen investments for exposure to nature-related risks.

STEP 1
Identify industries...

... with the most significant impacts and dependencies on nature

Using available prioritisation frameworks

STEP 2
Assess risks...

... through tools and datasets for the most significant impacts and dependencies in priority geographies

Using the concept of data stacks, focusing initially on impacts (pressures) and dependencies on nature

STEP 3
Respond to risks...

... by applying the knowledge gained through the previous steps to inform financial decision-making, including stewardship

How can financial institutions integrate nature data into Environmental, Social, Governance (ESG) screening processes today?

STEP 1

Identify industries

Identify priority industries in your portfolio, meaning those with the largest impacts and dependencies on nature.

STEP 2

Assess risks

Identify specific business risks associated with those impacts and dependencies.

Perform a first-cut screening test for investments in your (potential) portfolio to identify investments that could be considered high risk:

Start with data already collected for example for climate-related risk analysis and reporting against the Task Force on Climate-related Financial Disclosures (TCFD).

Then consider additional data, drawing from available resources listed in this guide.

STEP 3

Respond to risks

Apply the knowledge gathered from the above to inform financial decision-making, including stewardship.

Signal to investees that they need to collect and disclose asset-level (location specific) data.

Summary of the datasets and/or tools that can be used to gain information on impacts (or pressures), dependencies, and additional contextual information relating to nature for key industries. This shows in **blue** where financial institutions may already have existing relevant data (mostly from climate), and in **pink** where supplementary nature-related datasets and/or tools are needed to fill important gaps (detailed information on each dataset/tool is provided in Box 5).

	Impacts or pressures					Dependencies					Contextual information		
	Land/sea use change	Resource exploitation	Climate change	Pollution	Invasive species/other	Atmosphere	Habitats	Soil	Species	Water	Asset/project geolocation or sourcing region	Current/future state of nature	Management response
Agriculture	Ocean Health Index Foot-printing approaches Alternative individual datasets	ENCORE		ENCORE Ocean Health Index Foot-printing approaches	Alternative individual datasets	InVEST Global hotspots of natural capital depletion ENCORE	InVEST Global hotspots of natural capital depletion Ocean+, and critical, natural and modified habitat layers ENCORE	InVEST Global hotspots of natural capital depletion ENCORE	InVEST IBAT ENCORE	InVEST Global hotspots of natural capital depletion ENCORE		InVEST Global hotspots of natural capital depletion Ocean+ and critical, natural and modified habitat layers IBAT	Forest 500 SPOTT Trase Finance World Bench-marking Alliance Additional data to be collected via disclosures or engage-ment with companies
Energy													
Mining													
Transportation													
Food and beverages		ENCORE		ENCORE Ocean Health Index Foot-printing approaches						InVEST Global hotspots of natural capital depletion ENCORE			
Apparel													
Utilities													
Chemicals		ENCORE		ENCORE Ocean Health Index Foot-printing approaches						InVEST Global hotspots of natural capital depletion ENCORE			
Manufacturing													
Construction													

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Introduction

The finance sector relies on a wide range of portals, platforms, tools, and associated services to guide investment decisions. This now includes tools and datasets to screen for climate-related risks. When it comes to assessing nature-related risks (Box 1), lack of data has often been cited as a major barrier[1]. Yet, there are numerous datasets and tools that financial institutions can use today to integrate nature into Environmental, Social and Governance (ESG) screening, engagement, and reporting.

In line with the approach of the Taskforce on Nature-related Financial Disclosures (TNFD)[2], we define "nature-related risks" as the risks to an organisation posed by the linkages between its activities and nature. In addition to shorter term financial risks, this includes longer term risks represented by its impact and dependencies on nature. This is consistent with approaches to financial materiality that extend beyond immediate risks to consider transition risks, for example through the use of scenarios.

BOX 1
Definitions for key terms used in this investor guide. All definitions are drawn from TNFD (2022)[2].

Biodiversity: The variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.

Nature: The natural world, with an emphasis on the diversity of living organisms (including people) and their interactions among themselves and with their environment.

Nature-related risks: The potential threats posed to an organisation linked to its, and other organisations', dependencies on nature and nature impacts. These can derive from physical, transition and systemic risks.

Nature-related opportunities: activities that create positive outcomes for corporates and/or financial institutions and nature by avoiding or reducing impact on nature, or contributing to its restoration.

Physical risks: Physical risks are a direct result of an organisation's dependencies on nature. These are risks arising when natural systems are compromised, due to the impact of climatic events (e.g. extreme weather such as a drought), geologic events (e.g. seismic events such as an earthquake) or changes in ecosystem equilibria, such as changes in soil quality or ocean chemistry. These can be acute, chronic or both. Nature related physical risks arise as a result of changes in the biotic (living) and abiotic (non-living) conditions that support functioning ecosystems. Nature-related physical risks are broad, and are often associated with climate-related physical risks. They are driven by biological, chemical and other scientific processes. It is therefore important for corporates and financial institutions to understand how business activities result in changes in the state of nature and how this affects ecosystem service provision.

Transition risks: Transition risks are risks that result from a misalignment between an organisation's or an investors strategy and management and the changing landscape in which it operates. Developments aimed at halting or reversing the damage to nature, such as government regulations or policy, technological developments, market changes, litigation and changing consumer preferences, can all result in transition risks.

The context for this guide is the recognition that more than half the world's GDP is moderately or highly dependent on functioning ecosystems. However, the scale and pace of nature loss (47% of ecosystems altered, 1 million species at risk of extinction) have a direct bearing on the sustainability of billions of dollars invested in the real economy. Together with climate change, the degradation of these life support systems creates systemic risks that can – as a result of physical risks, regulatory/transition risks and/or market shifts – become unprofitable, unsustainable, or stranded[3].

For a financial institution, a greater understanding of the way economic activities and nature interact, as well as adopting quantitative metrics to measure these interactions, provide the first elements of an approach to manage its exposure to nature-related risks and opportunities. These interactions and measures are broadly categorised to obtain greater clarity on the organisation's impacts on nature, and the extent to which it is dependent on nature.

For sectors known to have high impacts on nature, quantitative impact metrics can be added to screening procedures. While these metrics and their availability continue to evolve,[4] the assessment of impact is made easier because relatively good data is often collected for land use change, water withdrawal, GHG emissions and pollution to support assessments of climate-related and broader environmental risks. Dependencies are more difficult to quantify, but recent analyses have started to show how these can be integrated in financial risk screening[5].

The systems change that is required is a redirection of public and private financial flows away from activities that harm nature (creating greater risks), towards organisations that manage their impacts and dependencies in a transparent and responsible manner. Given the increased momentum to halt the twin crises of biodiversity loss and climate change, it is critical that financial institutions start acting now to screen their portfolios for nature-related risks. Adopting the screening procedures in this investor guide is the first step towards helping financial institutions understand and manage the risks and opportunities associated with this transition.

Screening for nature-related risk relies on decision-grade data that is suitable for integrating within risk management systems. The use of nature-related datasets and tools, by corporates and financial institutions has typically been fragmented due to the perceived and real challenges in access, infrastructure, quality, and capacity[6, 7, 8].

Despite these challenges, a range of data sources exist today of a sufficient quality to provide a useful first screening of industry-level risks. Financial institutions do not need to wait for the perfect data and can use these readily available data sources now to guide their actions. In addition, work is underway to reach consensus on the five-to-ten core metrics that should be used to assess nature-related risks and opportunities[9].

Building from the close relationship between the TCFD and the TNFD framework – Beta release v0.1 this investor guide looks to bring nature alongside climate in ESG screening processes (i.e. as the first stage of investment management, corporate lending, project finance) by presenting a way of using nature-related datasets and tools to get started today. It focuses on the two first key steps that can be taken to gain practical insights into nature-related risks and opportunities. These two steps should be followed by a third step that will help financial institutions integrate nature-related risks in their decision-making.

The first two steps form an accessible checklist to help financial institutions identify the most insightful, currently available datasets and tools to integrate nature into ESG screening processes. Financial institutions should then complete a third step where they respond to risks by applying the knowledge gained through the first two steps. This should aim to ensure consideration of nature-related risks is integrated in their financial decision-making. In addition, the investor guide helps identify where data collected for assessing climate-related risks can be used to assess nature-related risks, and where the remaining gaps are. After completing the initial screening described in this investor guide, financial institutions can use more advanced footprinting tools, such as those recently highlighted by WWF[10], to assess portfolio impacts.

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Key steps to identify relevant datasets and tools

As outlined above, to develop a good initial view of nature-related risks, financial institutions should consider both risks that are considered material in the short term, as well as those that may become material in the longer term (Table 1). This guide focuses on tools and datasets that provide information on risks stemming from both impacts and dependencies on nature.

Table 1 | Categories of risk and associated examples adapted from TNFD (2022)

Physical Risk	Transition Risk	
Acute (event driven) E.g. direct damage to assets resulting from storms	**Policy and Legal** E.g. new regulations (such as EU Sustainable Finance Disclosure Regulation)	**Market** E.g. shareholder activism and changes in consumer preferences
Chronic (longer term shifts) E.g. loss of provision of key ecosystem services	**Technology** E.g. product substitution for lower environmental footprint (such as plant-based alternatives to meat)	**Reputation** E.g. challenges recruiting an increasingly environmentally conscious workforce into organisations with significant impacts on nature

Figure 1 | Key steps for identifying tools and datasets to assess nature-related risks and opportunities

STEP 1
Identify industries...
... with the most significant impacts and dependencies on nature

Using available prioritisation frameworks

Output: list of priority sectors for assessment and corresponding potential impacts and dependencies

STEP 2
Assess risks...
... through tools and datasets for the most significant impacts and dependencies in priority geographies

Using concept of data stacks, focusing initially on impacts (pressures) and dependencies on nature

Output: long list of prioritised invesments/assets for further analysis, based on impacts and dependencies, exposure to material risks, and state of nature in key geographies

STEP 3
Respond to risks...
... by applying the knowledge gained through the previous steps to inform financial decision-making, including stewardship

Output: engagement strategies for companies in high priority sectors, focusing on stewardship, risk mitigation, and filling data gaps

STEP 1 Identify industries with the most significant impacts and dependencies on nature

Start by identifying exposure to priority industries with the most significant direct impacts and dependencies on nature[12]. Financial institutions should begin with the synthesised list of industries shown in Figure 2. For this investor guide, the results are based on sector-level analyses of impacts and/or dependencies[13, 14, 15, 16] and of more general risks or issues[17, 18, 19].

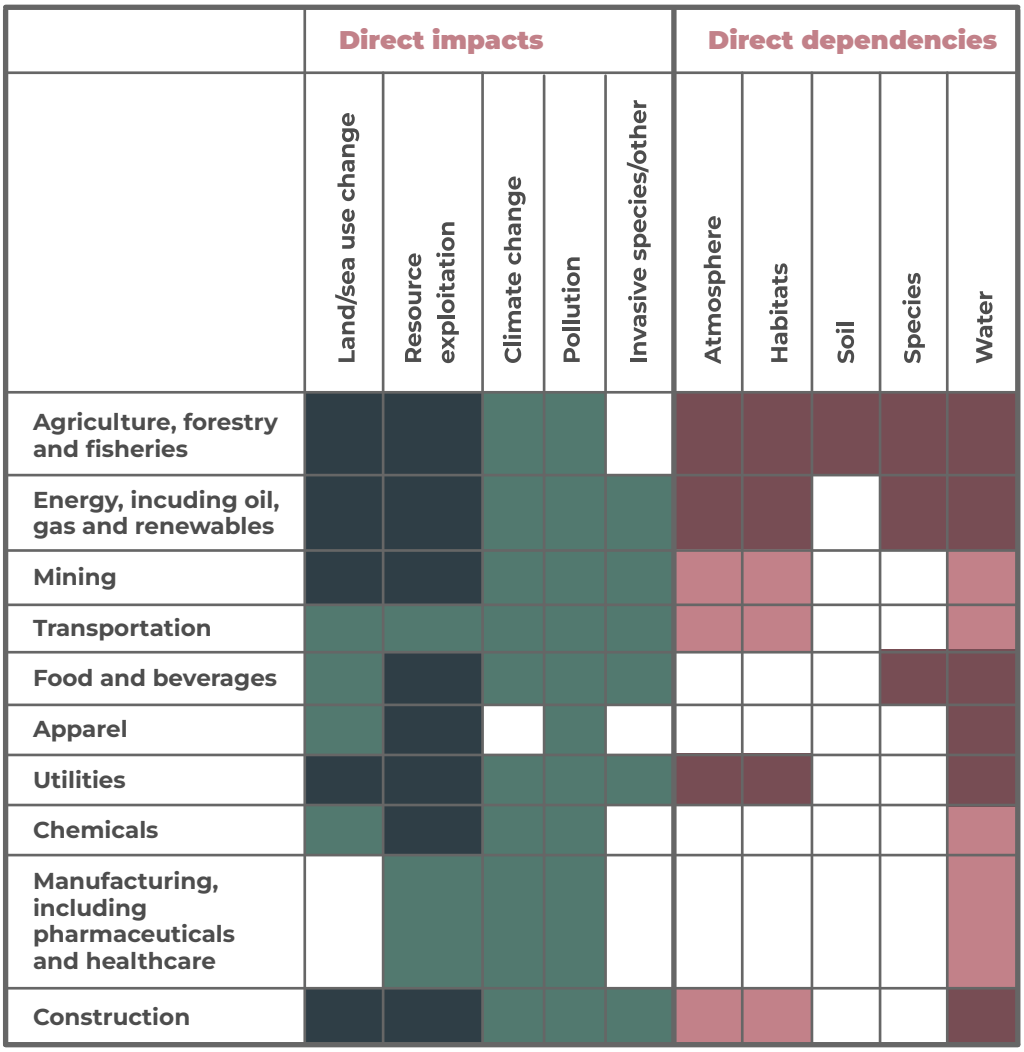
Figure 2

Priority industries for exploring nature-related risks, based on an analysis of the most significant impacts and dependencies conducted by UNEP-WCMC for this investor guide. The synthesis indicates whether the industry has significant impacts (orange), dependencies (blue), or both (green). Industries are ordered from highest to lowest potential risk exposure.

Next, identify the most significant direct impacts and dependencies. These indicate priority areas for financial institutions when undertaking screening for nature-related risks and opportunities, and/or engagement with customers, clients, or investees. Direct impacts and dependencies are shown in Figure 3 based on analysis of the ENCORE knowledge base.

Figure 3

Most significant direct impacts and dependencies on nature, by priority industry, identified through analysis of the ENCORE knowledge base. For impacts, the figure shows very high (**dark blue**), or high (**light blue**) material impacts for each industry. For dependencies, the figure shows natural capital assets[20] which are critical to the delivery of ecosystem services upon which the industry depends, with either very high (**dark pink**) or high (**pink**) materiality.



While the industries that potentially have the most significant impacts and dependencies on nature are known, the specifics of how and where those impacts and dependencies occur is not always clear. As recognised by the importance given to location in the TNFD Framework - Beta release v0.1 in this respect assessing nature-related risks differs from assessing climate-related risks. Impacts and dependencies on nature are locally specific, and therefore must be assessed at a granular geospatial scale. Spatially explicit datasets and tools that can be used to assess nature-related risks from different industries can be explored in Step 2.

The output of Step 1 is a list of priority industries from which the greatest nature-related risk stems and a list of their most significant direct impacts and dependencies on nature.

STEP 2 Assess risks associated with the most significant impacts and dependencies through tools and datasets

Based on the results of Step 1, financial institutions should identify a long-list of investments or assets types that require further analysis and select the most appropriate datasets and tools for this assessment. They can use the matrix presented in Figure 4 which shows priority industries against impacts, dependencies, and contextual information for assessing nature-related risks. The matrix includes datasets and tools that are relevant for business risks arising from different impacts and dependencies. The matrix was developed based on a review of 12 tools that were assessed for 1) whether they have already been tested by the finance sector; 2) whether they require knowledge on the locations of investments; and 3) the degree of knowledge/expertise required to apply them. Additionally, 91 datasets were assessed for their accessibility, authoritativeness (including traceability), frequency of update, temporality, and thematic coverage. More details on the review of global datasets underpinning this crosswalk are available in Annex 1.

By using the matrix, financial institutions can see **a)** where they may already have existing data, for example through assessing climate-related risks and reporting in the context of the TCFD (Box 2), and **b)** where are the gaps that need to be filled using nature-related datasets and/or tools[22]. They should then conduct company-specific assessments using these datasets and tools for the relevant companies in their portfolios. For each dataset, investors will need to decide what is an acceptable level of risk for a given investment. This will likely vary across sectors, types of risk, and geographies.

Step 2 has been developed for this investor guide, to align with the established "state, pressure, response" conservation framework and the concept of "data stacks", which is put forward in the proposed technical scope of the TNFD. The state, pressure and response framework is employed by governments, the conservation community, and the private sector to set nature-related policy goals and/or design nature-related conservation actions. The concept of data stacks helps to move from data that provide a basic understanding of exposure to nature-related risks through to data that provide insights into ecological and financial impacts (see Box 3).

BOX 2
Examples of data that may be available from climate-related risk assessments and that can be applied to nature-related risk assessments

Financial institutions and companies may have already collected information on the following aspects that can be applied to nature-related risk assessments:

- Greenhouse gas emissions (as a pressure on nature)
- Pollutants (e.g. non-greenhouse gas air pollutants, soil pollutants, water pollutants)
- Water use requirements / water withdrawals by source (e.g. ground water, surface water, municipal)
- Broad sourcing region or specific geolocation of investments
- Management response to key ESG issues (e.g. deforestation)

Other potential data sources that can be used for nature-related risk assessment, which financial institutions may already be using for climate-related risk assessments include:

- Maps of land use change
- Maps of soil productivity
- Maps of flood risk and/or drought risk

The above data sources are relevant to nature as well as climate since they can give an indication of the potential risks stemming from climate change and the degradation of nature. For example, maps of soil productivity can be used to assess **1)** where climate-related risks may be higher (e.g. in areas of low productivity and where reductions in productivity are expected due to temperature changes) and **2)** where nature-related risks may be higher (e.g. in areas of low productivity and where reductions in productivity are expected due to soil erosion and degradation).

Figure 4 Summary of the datasets and/or tools that can be used to understand impacts and dependencies, and provide contextual information for assessing nature-related risks, showing in **blue** where financial institutions may already have existing data, for example through assessing climate-related risks and TCFD reporting, and in **pink** where the gaps are that can be supplemented by nature-related datasets and/or tools (see details on each dataset/tool in Box 5 below).

	Impacts or pressures					Dependencies					Contextual information		
	Land/sea use change	Resource exploitation	Climate change	Pollution	Invasive species/other	Atmosphere	Habitats	Soil	Species	Water	Asset/project geolocation or sourcing region	Current/future state of nature	Management response
Agriculture	Ocean Health Index Foot-printing approaches Alternative individual datasets	ENCORE		ENCORE Ocean Health Index Foot-printing approaches	Alternative individual datasets	InVEST Global hotspots of natural capital depletion ENCORE	InVEST Global hotspots of natural capital depletion Ocean+, and critical, natural and modified habitat layers ENCORE	InVEST Global hotspots of natural capital depletion ENCORE	InVEST IBAT ENCORE	InVEST Global hotspots of natural capital depletion ENCORE		InVEST Global hotspots of natural capital depletion Ocean+ and critical, natural and modified habitat layers IBAT	Forest 500 SPOTT Trase Finance World Bench-marking Alliance Additional data to be collected via disclosures or engage-ment with companies
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Apparel													
Utilities													
Chemicals													
Manufacturing													
Construction		ENCORE		ENCORE Ocean Health Index Foot-printing approaches						InVEST Global hotspots of natural capital depletion ENCORE			

BOX 3
Fundamental concepts underpinning Step 2

State, pressure, response is a useful organising framework for understanding nature-related risks and is commonly used by governments to track attainment of policy targets, and by the conservation community and private sector to design and monitor interventions[23]. The state of nature is the condition and status of, for example species and ecosystems, the availability and quality of natural capital assets, and ecosystem services. Pressures are the extent and causes of nature loss, like land use change, resource exploitation, climate change, pollution, and invasive species[24]. Response is the management actions undertaken to reduce pressures, thereby improving the state of nature[19]. For example, organisational behaviour to mitigate negative impacts, from primary or secondary data sources, or via engagement with investee companies.

Financial institutions should be able to collate secondary data on state and pressures, for example using existing information from third parties like Non-Governmental Organisations (NGOs) on the status of species or ESG service providers on the pressures exerted by companies on nature. In the past it has been considered impractical for most financial institutions to collect primary (environmental) data. However, lessons from the Task Force on Climate-related Financial Disclosures (TCFD) show that lack of data is one of the greatest challenges to assessing climate-related risk[25].

This challenge holds true for assessing nature-related risks. Financial institutions must evolve to gather or procure primary data (for example, site survey data) to comprehensively address nature-related risk. This type of primary data is increasingly being collated by ESG service providers and some financial institutions (notably Development Financial Institutions and impact investors). Further examples of primary and secondary data sources are provided in Table 3.3 of the Natural Capital Protocol's Finance Sector Supplement[26].

The concept of using "data stacks" to assess nature-related risks is introduced in the Proposed Technical Scope for the TNFD. The first component of the data stack comprises data on impacts or pressures on nature (e.g. emissions, water pollution etc.) and dependencies (e.g. water use, abstraction rates etc.). Subsequent components of the stack provide the contextual information to estimate the implications of these impacts or dependencies, such as asset or project geolocation or sub-national sourcing regions, the current and future state of nature, and the organisation management response (e.g. the availability of water and water recharge rates etc.). Completing the data stack will provide insights into four key pieces of information: 1) a financial institution's exposure to nature-related risks; 2) the financial institution's management of said risks; 3) as a result of these first two, the remaining un-mitigated risk that gives rise to ecological impact; and 4) the resulting financial impact[27].

The first stage of the LEAP process (Locate, Evaluate, Assess, Prepare) outlined in the TNFD Framework – Beta release v0.1 emphasises the importance of location-specific data for investors. Over time, the direction signalled by the TNFD should result in the collection and disclosure of more primary data on asset location. The datasets/tools reviewed for this Investor Guide recognises both that location data is not yet routinely disclosed, and that investors do not always have the capacity to process or use location-specific information.

Each of the datasets/tools listed above is classified against three criteria in Box 5:

- Has it been user-tested with the finance sector?
- Does it require knowledge of the location of the investment e.g. the country or site in which it is located?[28]
- Is it usable without prior training in either Geographic Information Systems (GIS) or knowledge of Input-Output (IO) modelling?

Symbology used in Box 5 is as follows:

- User-tested with finance  (yes)  (no)
- Usable without knowledge of location  (yes)  (no)
- Usable without prior training  (yes)  (no)

BOX 4
Assessing supply chain impacts and dependencies

A key gap in current approaches to assessing nature-related risks for companies and financial institutions is the missing information on supply chains. While for some industries dependency risks are caused by their direct operations, for companies in secondary or tertiary sectors, these risks lie within their supply and value chains. This is particularly the case for those with opaque and complex supply structures. Location-specific supply chain data is largely unavailable to financial institutions, which makes it challenging to link impact and dependency data to local, contextual data. Input-Output models can help to address this challenge to an extent, but their results must be validated by financial institutions and companies.

To improve traceability, financial institutions need to work with companies towards disclosing location-specific supply chain data. Initiatives like Trase Finance are already delivering promising results for some key commodities with deforestation risks such as soy, palm oil and beef, where activities of supply chain actors can be linked to specific production areas in Brazil and Indonesia.

BOX 5
Datasets and/or tools for assessing nature-related risks that can be used to supplement existing data collected for understanding climate-related risks.

1. InVEST

Summary: InVEST is a suite of free, open-source software models used to map and value the goods and services from nature that sustain and fulfil human life. InVEST enables decision makers to assess quantified trade-offs between alternative management choices and to identify areas where investment in natural capital can enhance human development and conservation. The toolset includes ecosystem service models designed for terrestrial, freshwater, marine, and coastal ecosystems. InVEST models are spatially explicit, using maps as information sources and producing maps as outputs. InVEST returns results in either biophysical terms (e.g. tonnes of carbon sequestered) or economic terms (e.g. net present value of that sequestered carbon).

Use in screening: InVEST can be used to identify which ecosystem services an investment depends on. For those ecosystem services, InVEST can be used to identify locations where ecosystem services are most valuable and locations where their supply is low (state of nature). Both these factors will increase nature-related physical risks. Therefore, financial institutions can use InVEST to screen for high risk investments that are located in areas where ecosystem services they depend on are highly valuable and scarce.

Limitations: Running InVEST effectively does not require knowledge of a programming language (Python), but it does require basic to intermediate skills in GIS software. Additionally, models are data demanding, particularly if local applications are required. InVEST does not allow users to look at changes in ecosystem services over time or provide forward/backward-looking data.

2. Global hotspots of natural capital depletion

Summary: Maps to showcase global hotspots of relative natural capital depletion, made available for visualisation in ENCORE. This information will help investors identify potential exposure to natural capital depletion. The maps include: 1) overlapping hotspots of depletion of stocks of natural capital assets (atmosphere, water, soil and sediments, biodiversity) in terrestrial environments, and 2) overlapping hotspots of potential depletion of natural capital assets (e.g. marine sediment carbon, coral reefs, mangroves) in marine environments. Both maps show where human activities will be associated with higher risks of ecosystem service loss or degradation.

Use in screening: These maps can be used to identify where natural capital assets are being depleted. As a result, this shows where nature-related physical risks related to dependency on those assets is highest. Impacts on depleted assets will be more likely to translate to transition risk in areas where that asset is being depleted. Therefore, financial institutions can use these maps to screen for high risk investments that are located in areas where natural capital in being heavily depleted.

Limitations: Datasets used to develop these maps are associated with different time periods or years. For some indicators there is a lack of suitable global-scale data or data showing changes over time.

BOX 5
Datasets and/or tools for assessing nature-related risks that can be used to supplement existing data collected for understanding climate-related risks.

3. Ocean+, and critical, natural and modified habitat layers

Summary: The Ocean Data Viewer allows users to view and download a range of spatial datasets that are useful for informing decisions affecting marine and coastal biodiversity. UNEP-WCMC also provide access to a Global Critical Habitat Screening Layer, showing the global spatial distribution of likely or potential Critical Habitat (in both marine and terrestrial realms), as defined by the International Finance Corporation's Performance Standard 6 (IFC PS6) criteria. A complementary Global Natural and Modified Habitat Screening Layer is also available and aligned with IFC PS6 definitions.

Use in screening: Can be used to identify the current state of habitats that an investment depends on. In cases of high dependency on a specific habitat, these maps can be used to identify locations where the habitat is critical, natural or modified. Therefore, financial institutions can use these data layers to identify high risk investments that are located in areas where impacts on habitats would result in the greatest nature-related physical risk.

Limitations: Ocean+ or the Ocean Data Viewer are not specifically aimed at the finance sector, therefore data would need to be interpreted. The critical, natural and modified habitat layers have gaps, as reliable and up-to-date spatial information is not available across all taxonomic groups and ecosystem types. The resolution, age, and completeness of the datasets create the potential for omission and commission errors.

4. IBAT

Summary: The Integrated Biodiversity Assessment Tool (IBAT) offers a 'one-stop shop' data search service for those seeking authoritative global biodiversity information. It is underpinned by three of the world's most authoritative global biodiversity datasets and enables users to make informed decisions in policy and practice: the World Database on Protected Areas, IUCN Red List of Threatened Species, and the World Database of Key Biodiversity Areas. The Species Threat Abatement and Restoration metric (STAR), available through IBAT, helps users understand how they can contribute toward reducing global species extinction risk.

Use in screening: IBAT can be used to identify protected areas, species at risk of extinction and other areas of high biodiversity value that could be overlapping with an investment. Impacts on particular species will be more likely to translate to transition risk in areas where that species is at risk of extinction or in areas of high biodiversity value. Therefore, financial institutions can use IBAT to screen for high risk investments that are located in areas with high protected area coverage, high levels of Threatened species, or high biodiversity value.

Limitations: There is a free version of IBAT with basic functionality. Access to custom reports and data downloads requires a subscription or use of the pay-as-you-go service. While the data in IBAT is regularly updated they are drawn from multiple sources, and in some cases data points may have been developed 10 years ago. The datasets in IBAT do not show change over time.

BOX 5
Datasets and/or tools for assessing nature-related risks that can be used to supplement existing data collected for understanding climate-related risks.

5. ENCORE

Summary: ENCORE (Exploring Natural Capital Opportunities, Risks and Exposure) is a tool to help users and particularly financial institutions to understand and visualise the impact of environmental change on the economy. A new biodiversity module for mining and agriculture assists financial institutions in moving from interventions that focus on reducing negative impacts towards those that focus on increasing positive impacts for biodiversity. Users can explore current portfolio potential to reduce species extinction and ecological integrity risk and options for increasing alignment with global goals. ENCORE also collates spatial datasets on pressures on nature (identified as impact drivers and drivers of change in the tool's framework) for use by financial institutions. For download, users are directed to the original data source.

Use in screening: ENCORE can be used to identify material impacts and dependencies on nature per industry, as well for locations where multiple pressures are likely to lead to heightened risks. Therefore, financial institutions can use ENCORE to screen for high risk investments that **1)** are in industries that have high potential impacts and dependencies on nature; and **2)** are located in areas with higher potential physical risks.

Limitations: ENCORE does not provide interpretation of the different datasets it displays or overlay with company assets. Data were selected for their ability to provide insight into disruption risk to ecosystem services and may not represent all pressures. Pressures are not linked back to companies.

6. Ocean Health Index

Summary: The Ocean Health Index (OHI) is a framework to quantitatively evaluate ocean health, with global assessments repeated every year since 2012. OHI recently mapped the cumulative impact of human activities on global oceans from 2003 to 2013. The data from this analysis are all available online, with a package for each stressor, e.g. sea-level rise, shipping, commercial fishing.

Use in screening: The Ocean Health Index can be used to identify impacts in the marine realm. This could be relevant for investments such as fisheries. With appropriate geographical information financial institutions can use the Ocean Health Index to screen for high risk investments in areas of high potential pressure on the marine realm.

Limitations: While efforts to maintain the OHI are ongoing, the datasets for each stressor are not updated frequently. The OHI is not provided in a format that is easily interpretable by financial institutions, so basic to intermediate skills in GIS software are required. Many known stressors are not included due to a lack of data.

BOX 5
Datasets and/or tools for assessing nature-related risks that can be used to supplement existing data collected for understanding climate-related risks.

7. Footprinting approaches, for example Global Biodiversity Score (GBS), Biodiversity Impact Analytics-Global Biodiversity Score (BIA-GBS) and Biodiversity Footprint Financial Institutions (BFFI)

Summary: Footprinting approaches like the Global Biodiversity Score and Biodiversity Footprints for Financial Institutions (BFFI) are underpinned by models, like GLOBIO and ReCiPe, which quantify the pressures from economic activities. For example, GLOBIO calculates local terrestrial biodiversity intactness, expressed by mean species abundance (MSA), as a function of six human pressures: land use, road disturbance, fragmentation, hunting, atmospheric nitrogen deposition and climate change. MSA ranges from 0 to 1, where 1 means that the species assemblage is fully intact, and 0 means that all original species are locally extinct.

Use in screening: Footprinting approaches can be used to identify potential impacts of both industries more broadly and of investments at the company level. They identify pressures like land use change and climate change. With appropriate geographical information, footprinting approaches can be used by financial institutions to screen for areas of high potential pressure, which could therefore be of higher risk.

Limitations: The approaches are likely to require a tailored approach with the developers to apply these to financial institutions' individual portfolios or activities. Some are commercial tools with associated costs. The technical knowledge needed to apply the approaches will likely have high costs and a detailed assessment might take a couple of months. Data included in these approaches is largely based on modelled datasets. These are most often only able to indicate potential impacts based on drivers of nature loss associated with economic activities or based on information derived from company turnover. They depend on the input of environmental data that may be out of date and may exclude certain key pressures. The available metrics focus on community-level information meaning they mostly capture integrity at the ecosystem level and do not factor in the importance of the species whose abundance is being reduced, nor do they capture their threat status.

8. Forest 500

Summary: The Forest 500, developed by Global Canopy, provides an assessment of the most influential companies and financial institutions in forest risk commodity supply chains. It identifies and ranks companies and Financial Institutions based on: **1)** their risk of being linked to tropical deforestation through involvement in or potential exposure to forest risk commodity supply chains; and **2)** their influence within the political economy of tropical deforestation. The Forest 500 "power-brokers" are assessed on an annual basis and include 350 companies, operating in at least one of the key forest-risk commodities (beef, rubber, palm oil, pulp and paper, soy and timber) and 150 financial institutions that provide the most finance to these companies through shares, loans and underwritings, and bonds.

Use in screening: Forest 500 can be used to identify companies and financial institutions that are potentially exposed to physical, operational, legal and reputational risks due to their links to tropical deforestation and to identify their level of response to these risks. Financial institutions can therefore screen their company-level investments for high-risk companies that are more exposed to nature-related risks.

Limitations: The Forest 500 assessment is based on publicly available data and data provided by companies and financial institutions themselves (e.g. CDP data). However, for some sectors there is still a lack of data available from public reporting. Furthermore, market concentration is used as an important indicator of power within supply chains. Therefore, companies occupying a smaller market share within their respective area of operations are not included in the Forest 500.

BOX 5
Datasets and/or tools for assessing nature-related risks that can be used to supplement existing data collected for understanding climate-related risks.

9. Trase Finance

Summary: Trase Finance is a supply chain mapping tool. It uses publicly available financial and company ownership data (including information on lending and company legal structures) to identify financial institutions' direct and indirect exposure to deforestation risk. Trase focuses on the financing and ownership structures of companies involved in the trade of Brazilian beef, Brazilian soy and Indonesian palm oil. Going beyond the company-level deforestation attribution that Trase provides, Trase Finance, aggregates and attributes indirect deforestation risks to the financial institutions that are involved in financing commodity trading companies. Trase Finance is a partnership between Global Canopy, Stockholm Environment Institute and Neural Alpha.

Use in screening: Trase Finance can be used by financial institutions to screen portfolios and identify direct and indirect exposure to deforestation risk. Trase lists over 4,700 companies trading beef, soil and palm oil and over 12,500 financial institutions that finance companies trading these commodities.

Limitations: Trase Finance is currently limited to the key commodities driving deforestation in specific geographies, namely Brazilian beef and soy, and Indonesian palm oil.

10. ZSL SPOTT

Summary: The Sustainability Policy Transparency Toolkit (SPOTT) by the Zoological Society of London (ZSL) is an online platform that assesses commodity producers, processors and traders on their public disclosure of policies and practices related to ESG issues. SPOTT focuses on tropical forestry, palm oil and natural rubber companies. Companies are assessed annually using over 100 different indicators aligned with widely accepted reporting initiatives such as the Global Reporting Initiative, CDP and UN Global Compact. Companies are selected for assessment based on: **1)** their operations in priority countries (i.e. in areas of high biodiversity value threatened by commodity production); **2)** their scope and scale of operations; and **3)** nominations by interested stakeholders or companies volunteering themselves.

Use in screening: SPOTT can be used to assess and track companies' progress on public commitments towards environmental and social best practice. It focuses specifically on companies involved in the production of timber and pulp, palm oil, and natural rubber. Financial institutions can use SPOTT to screen high risk investments that are potentially exposed to higher nature-related risks.

Limitations: The SPOTT assessments are based on publicly available data, provided by companies themselves. As such any activities that are not publicly disclosed by companies will not be included in the information provided by SPOTT.

11. Alternative individual datasets

Further to the tools listed above, there are numerous individual datasets that can be used to identify impacts or pressures, dependencies and provide contextual information on, for example, the state of nature. These datasets were compiled for the purposes of this investor guide and can be accessed here. Examples include datasets on air pollution, invasive species, global fisheries production (among others). This is not intended to be an exhaustive list. There will likely be other datasets available, particularly those held by ESG service providers. Beyond that, financial institutions may use stock market indices that aim at representing companies that integrate biodiversity into their risk management and strategy, such as the Solactive Vigeo Eiris Biodiversity Index.

STEP 3 Respond to risks by applying the knowledge gained through the previous steps to inform financial decision-making, including stewardship

Once the first two steps have been completed, investors should take stock of their findings and apply the knowledge they have gained to inform their financial decision-making. Investors should seek to adopt a stewardship approach and engage with companies to move from assessing potential nature-related risk to understanding actual nature-related risk. This will require a detailed understanding of company management practices to mitigate risks at production locations. Two key priorities for investors in this step should be:

1. Signal to investees that they need to collect and disclose asset-level (location specific) data.

2. To fill any data gaps that remain following completion of Steps 1 and 2.

3

Application with a hypothetical financial portfolio

In this section, a worked example with two companies demonstrates how several datasets and tools can be used to provide information on the impacts and dependencies of a hypothetical portfolio of investments on nature:

Company	Sub-industry	Location of investment
A	Internet & Direct Marketing Retail	USA
B	Semiconductor Equipment	USA
C	Mining	UK
D	Distillers/Vintners	UK
E	Utilities	Italy
F	Leisure Products	USA
G	Apparel	France
H	Interactive Media & Services	China
I	Interactive Home Entertainment	France
J	Household Products	UK

STEP 1 Which of these companies are in industries with significant impacts and dependencies on nature?

For those companies, what are the key direct impacts and dependencies for these industries/companies?

· Based on Figure 2 above, the following companies are in industries with significant impacts and dependencies on nature:

- Company C (Mining)
- Company D (Food and beverages)
- Company E (Utilities)
- Company G (Apparel)

· The key direct impacts and dependencies for these industries/companies are as follows (**bold = very high materiality**):

Company	Sub-industry	Headquarters	Key direct impacts and dependencies
Company C	Mining	UK	Atmosphere, Habitats, Water **Land/sea use change, Resource exploitation,** Climate change, Pollution, Invasive species/other
Company D	Distillers/Vintners	UK	**Water, Species** **Land/sea use change,** Resource exploitation, Climate change, Pollution
Company E	Utilities	Italy	**Atmosphere, Habitats, Water** Land/sea use change, Resource exploitation, Climate change, Pollution, Invasive species/other
Company G	Apparel	France	**Water** **Resource exploitation,** Land/sea use change, Pollution

STEP 1 Summary

· Four of the ten companies in the portfolio are considered higher priority based on their industries' significant impacts and dependencies on nature.

· Across the hypothetical portfolio, the following are key areas to explore further in screening for nature-related risks (based on highest potential materiality):

- **Impacts:** Pressures on nature, through land/sea use change, climate change, pollution, resource exploitation (e.g. water and other materials), and invasive species.

- **Dependencies:** State of nature, including atmosphere, habitats, species, and water, and where they are being depleted.

STEP 2 Target risks through tools and datasets for the most significant impacts and dependencies

For simplicity, two companies from the above list of four highest priority are taken forward to Step 2. Tasks include:

- Cross-checking the priority industries and most significant impacts and dependencies to identify the most appropriate tools for further assessment.
- Using the information provided in Figure 4, to identify appropriate tools and datasets to help with screening (greyed out cells represent impacts or dependencies that are neither high nor very high in materiality):

		Apparel	Mining
Impacts or pressures	Land/sea use change	Ocean Health Index, Footprinting approaches, and other individual datasets	Ocean Health Index, Footprinting approaches, and other individual datasets
	Resource exploitation	ENCORE	E.g. TCFD, ESG service providers
	Climate change	E.g. TCFD	E.g. TCFD
	Pollution	ENCORE, the Ocean Health Index, and Footprinting approaches	E.g. TCFD, ESG service providers
	Invasive species/other	Other individual datasets	Other individual datasets
Dependencies	Atmosphere		InVEST, global hotspots of natural capital depletion, or ENCORE
	Habitats		InVEST, global hotspots of natural capital depletion, Ocean+ and critical, natural and modified habitat layers, and ENCORE
	Species		
	Water	Global hotspots of natural capital depletion, ENCORE	E.g. CDP Water, GRI, SASB
Contextual information	Asset/project geolocation or sourcing region	E.g. TCFD, ESG service providers	E.g. ESG service providers
	Current/future state of nature	InVest, IBAT, Ocean+ or the global hotspots of natural capital depletion	Global hotspots of natural capital depletion, Ocean+ and critical, natural and modified habitat layers, IBAT
	Management response	World Benchmarking Alliance	World Benchmarking Alliance

Apply the datasets and tools in company-specific assessment

> Based on an understanding of where activities are located (whether the exact location, just the country, or other jurisdiction of, for example, sourcing), the most insightful tools and datasets can be used by financial institutions to further understand the most significant types of nature-related risks. An example for two companies in the portfolio with hypothetical locations of key operations is shown below. If locations of activities are unknown to the financial institution, this could be gained either through certain ESG service providers, through disclosures, or through direct engagement with companies.

Example 1: Company G (Apparel)

Company G hypothetical analysis with the datasets and tools highlighted in this investor guide.
This hypothetical example assumes Company G has a factory located in France and are sourcing a key material from India.

Data requirements

Component 1 – Impacts and dependencies

Impacts – Data is required on the following impacts:
• Land/sea use change – available from the Ocean Health Index, Footprinting approaches, and other individual datasets
• Resource exploitation (water use and other resource use, e.g. cotton) – available from ENCORE
• Pollution – available from ENCORE, the Ocean Health Index, and Footprinting approaches
• Invasive/alien species – available from other individual datasets (e.g. the Global Register of Introduced and Invasive Species)

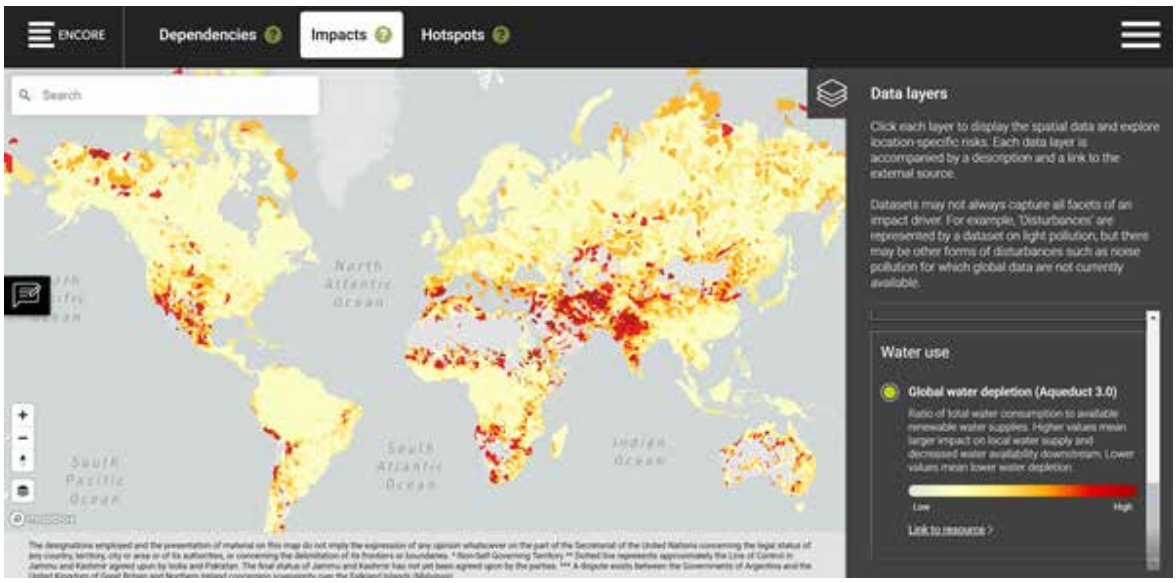
Dependencies – Data is required on the following dependencies:
• Water – available from InVEST, global hotspots of natural capital depletion, or ENCORE

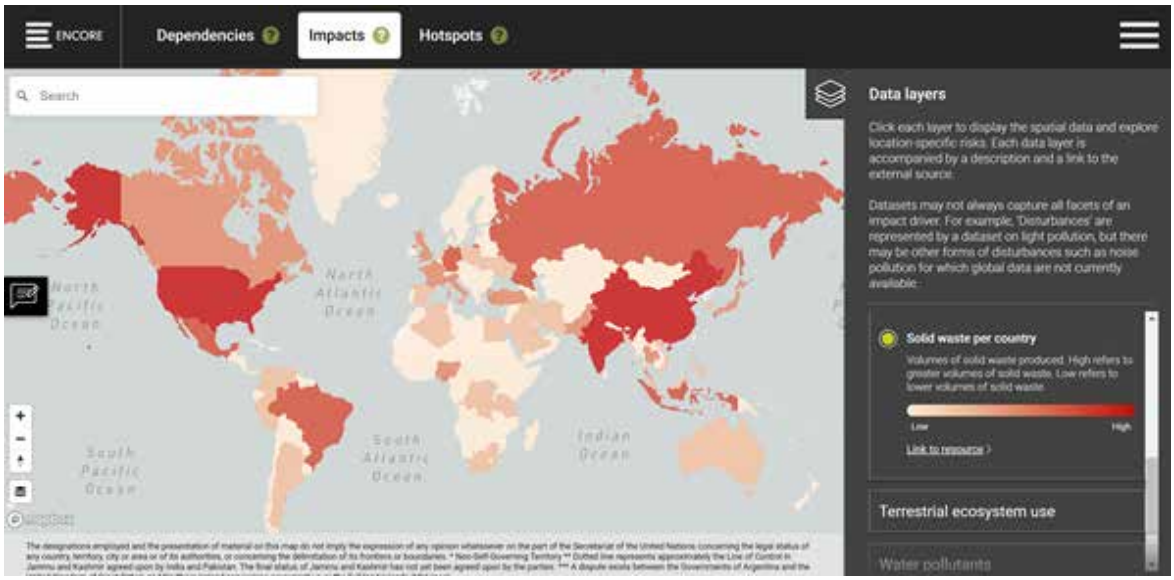
Component 2 – Contextual information
Data is required for the following to compete the data stack:

• Asset/project geolocation data – Is available through climate risk assessments for direct operations (country-level data for upstream and downstream operations) – the specific location of the factory in France is known, but there is a key source in India for which the exact location is unknown
• Current and future state of nature – Contextual information on the current/state of nature is needed – from InVest, IBAT, Ocean+ or the global hotspots of natural capital depletion
• Management response – This information is available from the company's public sustainability reporting and other sources (e.g. World Benchmarking Alliance, ESG service providers)

Knowledge/skills
If the financial institution does not have training in GIS or I-O modelling, they can use the following tools to assess nature-related risks:
• Global hotspots of natural capital depletion (water dependency and state of natural capital)
• ENCORE (pressures on nature)
• Critical, natural and modified habitat layers, and IBAT (state of habitats and species)

Figure 5 | Spatial data layers in ENCORE showing global water depletion (top) and solid waste (bottom) per country





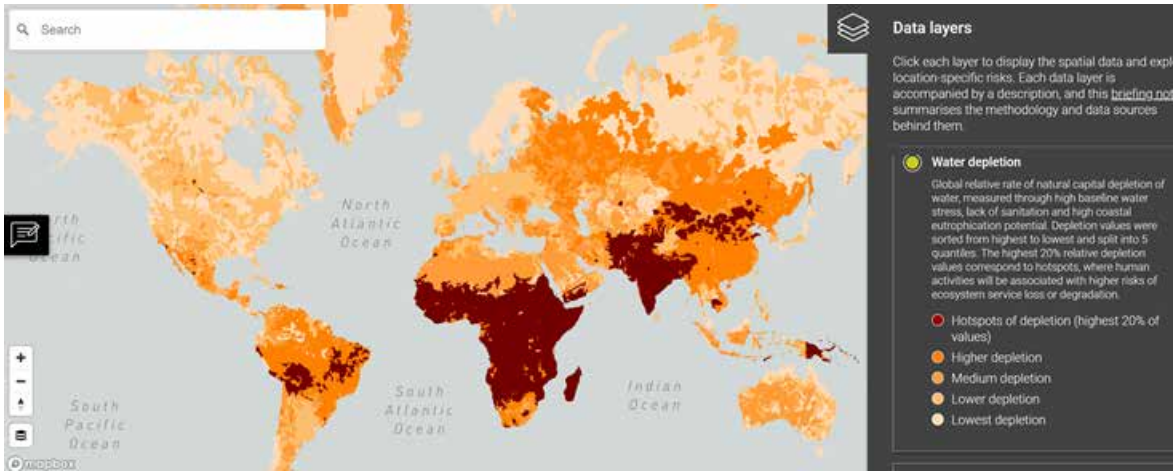
Analysis

Component 1 – Impacts and dependencies

• Impacts: Using ENCORE maps of impacts (collated from multiple data providers), the pressures on nature, for example water use and solid waste, are shown to be relatively high in India and relatively low in France. This is shown by the darker red colour on the maps in Figure 5. Areas of low-to-medium risk potential are those that are lighter in colour on the maps[29]. This means heightened physical risks at the India sourcing location, with impacts more likely to translate into transition risk.

• Dependencies: If Company G has a factory located in France, and are sourcing one type of material from India, the global hotspots of natural capital depletion show that nature-related physical risks due to dependencies on water are likely to be highest in the sourcing location (see Figure 6). In this example, impacts at the sourcing location are likely to translate into transition risk as water is being heavily depleted in India. This is shown by the darker red colour on the map in Figure 6. Areas of low-to-medium risk potential are those that are lighter in colour on the maps.

Figure 6 | Global hotspots of water depletion

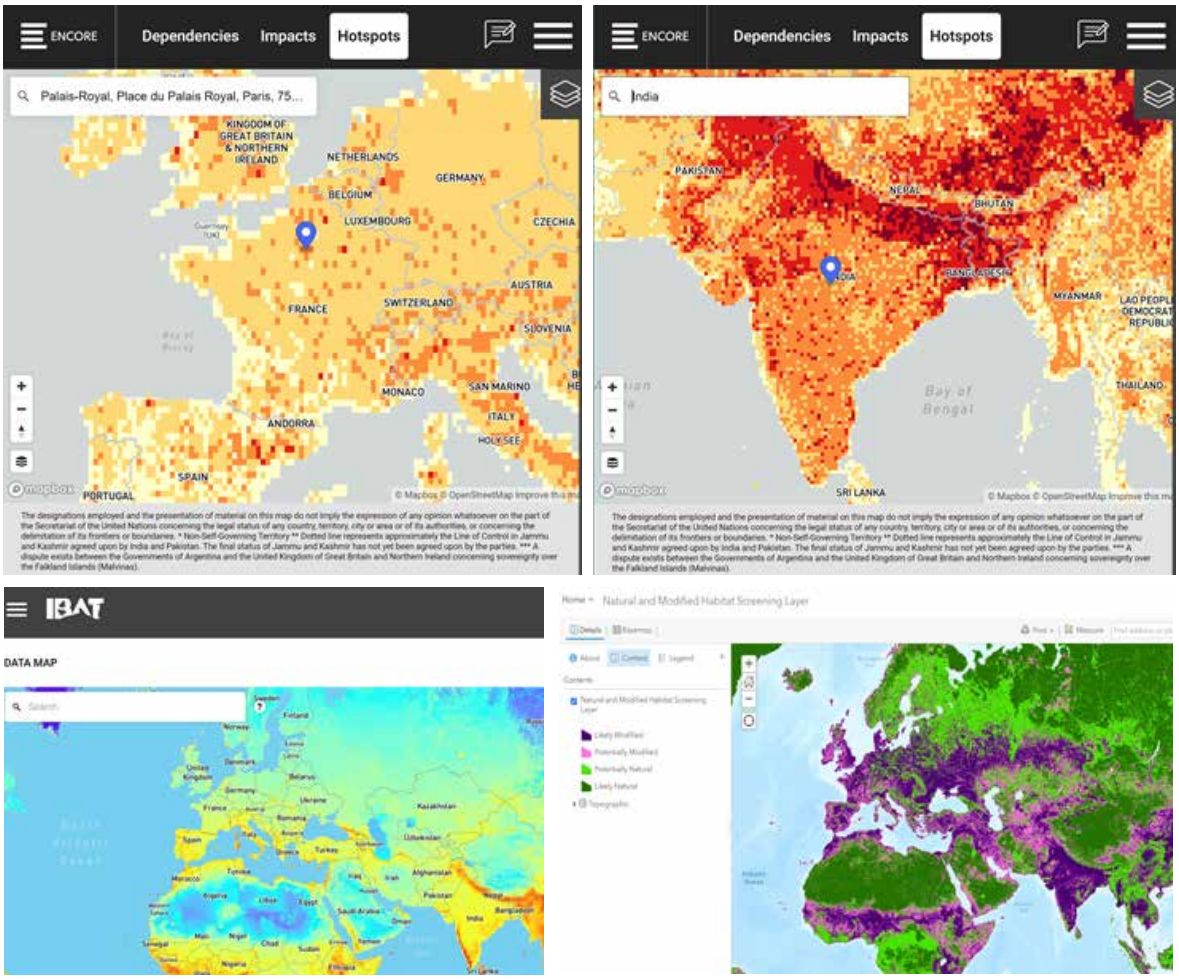


Component 2 – Contextual information

• Asset/project geolocation: as stated above, this is available through climate risk assessments for direct operations – the specific location of the factory in France is known, but there is a key source in India for which the exact location is unknown

• Current and future state of nature: the combined maps of hotspots of natural capital depletion show that the overall state of natural capital is being depleted to a high degree in India. In France, the overall state of natural capital is being depleted to a medium degree. Maps in IBAT based on the IUCN Red List show that the area surrounding the sourcing location in India may hold a large number of Threatened species. In addition, the Natural and Modified Habitat Screening Layer shows that India has more areas of natural habitat that may overlap with the sourcing location. Impacts on particular species, habitats or natural capital assets will be more likely to translate to transition risk in areas where that species is at risk of extinction, where the natural capital asset is being depleted or where there is a large proportion of natural habitat. On the maps in Figure 7 areas of higher potential risk are denoted by darker red colours. Investments in these areas should be flagged during the screening procedure. Additional due diligence and/or engagements with companies should be undertaken for activities located in those areas.

Figure 7 Combined maps of hotspots of natural capital depletion in ENCORE (top), range rarity layer in IBAT (bottom left) and the Natural and Modified Habitat Screening Layer (bottom right).



Example 2: Company C (Mining)

Company C hypothetical analysis with the datasets and tools highlighted in this investor guide. This hypothetical example assumes Company C have a mine located in Brazil and a downstream distribution centre in California for which the exact location is unknown.

Data requirements

Component 1 – Impacts and dependencies

Impacts – Data is required on the following impacts:
• Land/sea use change – available from the Ocean Health Index, Footprinting approaches, and other individual datasets
• Resource exploitation (e.g. water use) – available from existing climate-related risk assessments and/or from ESG service providers
• Climate change – available from existing climate-related risk assessments and/or from ESG service providers
• Pollution (e.g. air, soil, and water pollutants) – available from ESG service providers, ENCORE, the Ocean Health Index, and Footprinting approaches
• Invasive species/other – available from other individual datasets (e.g. the Global Register of Introduced and Invasive Species)

Dependencies – Data is required on the following dependencies:
• Atmosphere – available from InVEST, global hotspots of natural capital depletion, or ENCORE
• Habitats – available from InVEST, global hotspots of natural capital depletion, Ocean+ and critical, natural and modified habitat layers, and ENCORE
• Water – available from existing climate-related risk assessments and/or from ESG service providers

Component 2 – Contextual information

Data is required for the following to compete the data stack:
• Asset/project geolocation data – Is available through climate risk assessments for direct operations (country-level data for upstream and downstream operations) – the exact location of a mine in Brazil is known, but there is a key distribution centre in California for which the exact location is unknown
• Current and future state of nature – Contextual information on the current/state of nature is needed – from InVest, IBAT, Ocean+ or the global hotspots of natural capital depletion
• Management response – This information may be available from the company's public sustainability reporting and other sources (e.g. the World Benchmarking Alliance, ESG service providers)

Knowledge/skills
If the financial institution does not have training in GIS or I-O modelling, they can use the following tools to assess nature-related risks:
• Global hotspots of natural capital depletion (atmosphere, habitats and water dependency and state of natural capital)
• ENCORE (pressures on nature)
• Critical, natural and modified habitat layers, and IBAT (state of habitats and species)
• ESG service providers (impacts such as pollutants; company response information)

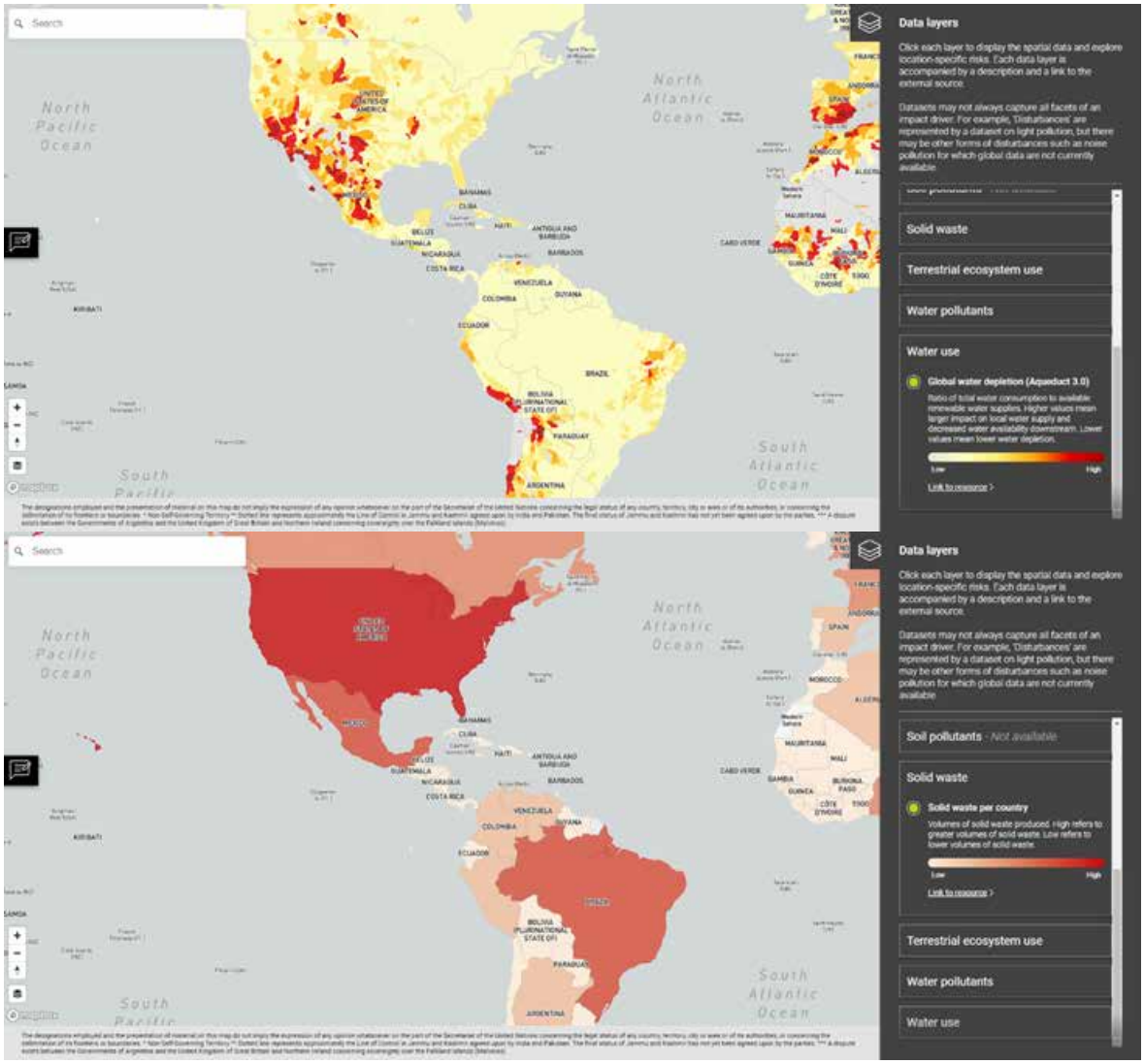
Analysis

Component 1 – Impacts and dependencies

Impacts:

- Using ENCORE maps of impacts (collated from multiple data providers), the pressures on nature from, for example, water use and solid waste are shown to be high in California and medium-to-low in Brazil.
- This means heightened physical risks at the California distribution centre as well as potentially at the mine in Brazil, with impacts more likely to translate into transition risk.
- The above should be supplemented by information collected through company disclosures or climate-related risk assessments (e.g. CDP water security disclosure, GRI reporting, or from ESG service providers).

Figure 8 Spatial data layers in ENCORE showing global water depletion (top) and solid waste (bottom) per country



Dependencies: If Company C have a mine in Brazil and a key distribution centre located in California, the global hotspots of natural capital depletion show that:
• Nature-related physical risks due to dependencies on atmosphere are likely to be high in Brazil and medium-to-high in California (see Figure 9).
• Nature-related physical risks due to dependencies on habitats are likely to be high in both Brazil and California (depending on the exact location of the distribution centre in California; see Figure 10).
• Nature-related physical risks due to dependencies on water are likely to be high in Brazil (see Figure 11), however, this should be checked against any information available through company disclosures or climate-related risk assessments.
• Impacts at the mine in Brazil are likely to translate into transition risk as, overall, natural capital is depleted to a high degree in Brazil.

Figure 9 | Global hotspots of atmosphere depletion

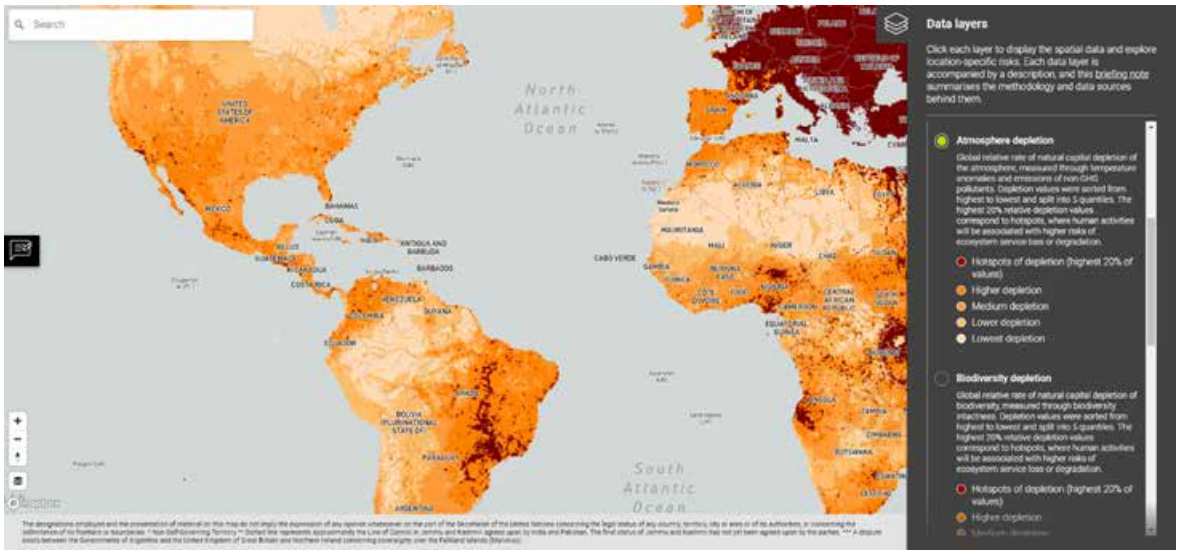


Figure 10 | Global hotspots of biodiversity depletion (encompassing habitats)

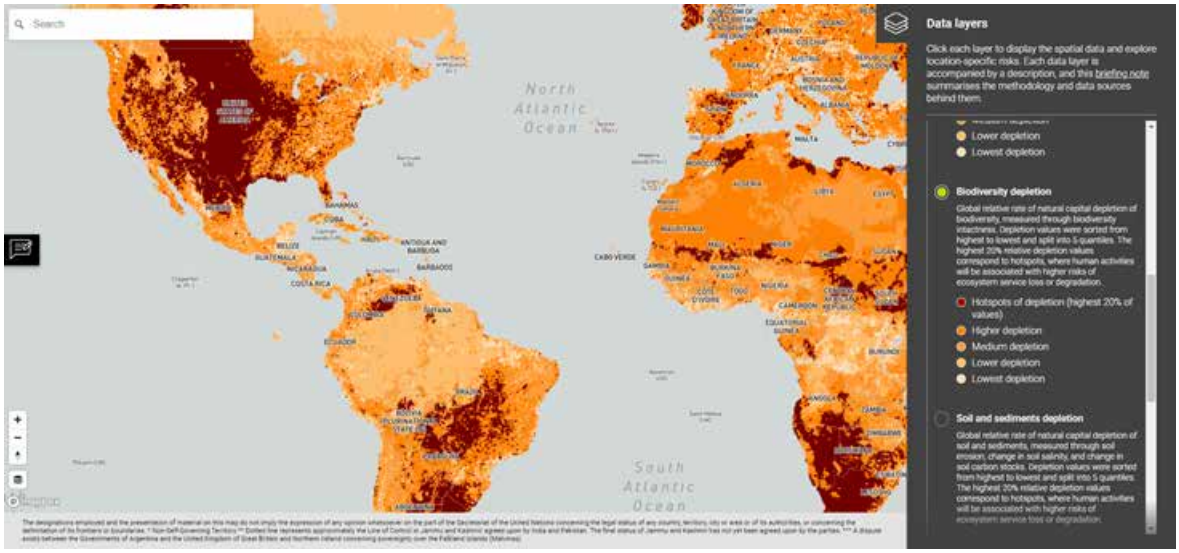
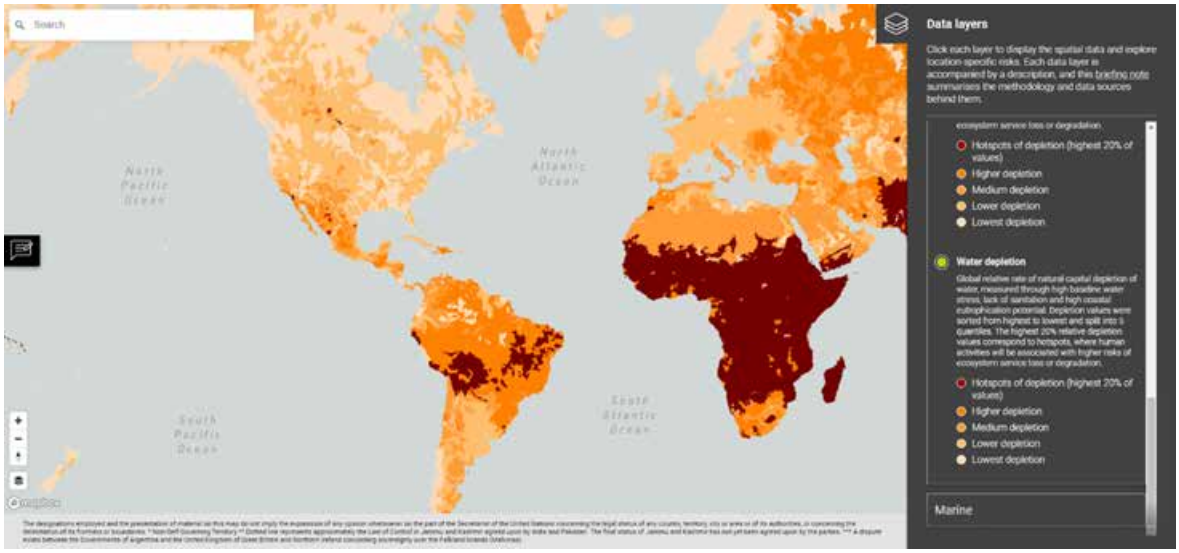


Figure 11 | Global hotspots of water depletion



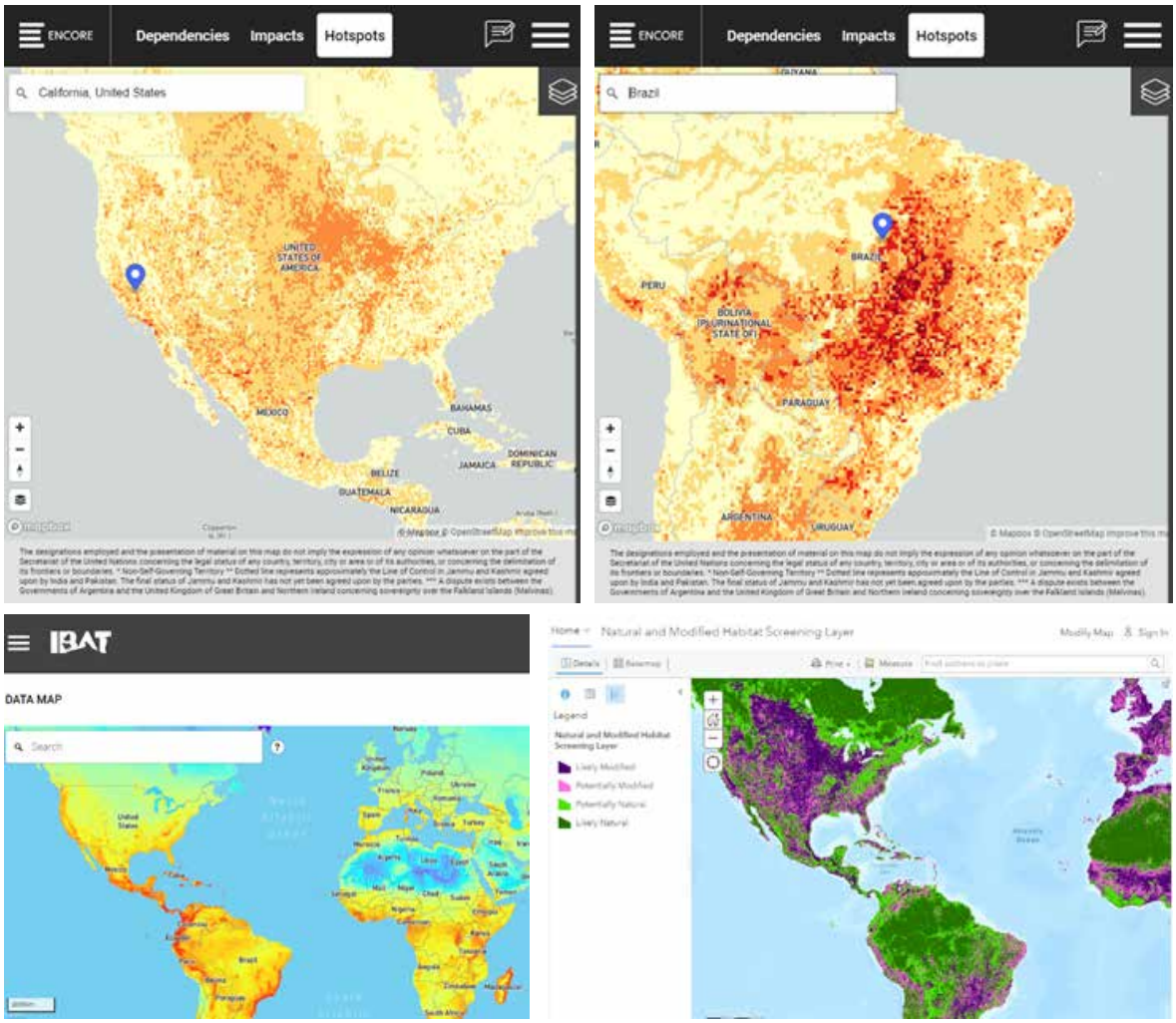
Component 2 – Contextual information

• Asset/project geolocation: as stated above, this is available through climate risk assessments for direct operations – the specific location of the mine in Brazil is known, but there is a key downstream distribution centre for which the exact location is unknown.

• Current and future state of nature: Based on the combined maps of hotspots of natural capital depletion, the overall state of natural capital is being depleted to a high degree in Brazil, and to a medium-to-low degree in California. Maps in IBAT based on the IUCN Red List show that the areas surrounding both the distribution centre and the mine in Brazil may hold a large number of Threatened species. Additionally, the Natural and Modified Habitat Screening Layer shows that Brazil has vast areas of likely and potential natural habitat that may overlap with the mine. Impacts on particular species, habitats or natural capital assets will be more likely to translate to transition risk in areas where those species are at risk of extinction, where the natural capital assets are being depleted or where there is a large proportion of natural habitat. As with example 1, investments in these areas should be flagged during the screening procedure. Additional due diligence and/or engagements with companies should be undertaken for activities located in those areas.

• Management response: This information should be gathered from the company's public sustainability reporting and other sources (e.g. the World Benchmarking Alliance, ESG service providers).

Figure 12 Combined maps of hotspots of natural capital depletion in ENCORE (top), range rarity layer in IBAT (bottom left) and the Natural and Modified Habitat Screening Layer (bottom right).



STEP 2 Summary

Example 1: Company G (Apparel)

If the investor considers locations within the top 20% of values based on water depletion as high risk, then Company G's sourcing location in India could be categorised as High risk. This is due to high potential water consumption and solid waste production in the country, and the fact that India is a hotspot of water depletion according to the map (i.e. it is within the top 20% of values for water depletion, meaning that provision of water-related ecosystem services are at risk of disruption). Additionally, many areas in India have been identified as having values within the top 20% for depletion of overall natural capital. There is also greater potential for the sourcing location to overlap with natural habitat and areas where species are at risk of extinction.

If the investor considers locations with values between 20% to 40% depletion as low risk, then Company G's factory location could be categorised as Low risk. This is because the ratio of total water consumption to available renewable water is low. Similarly, the volumes of solid waste produced are medium-to-low since they are in the range of the 50% highest values. Additionally, France has Medium values for hotspots of water depletion (i.e. roughly in the middle of the range of values for water depletion). This means that water provision as an ecosystem service is less likely to be disrupted. Finally, the factory in France has a low potential to overlap with natural habitats or species at risk of extinction.

This analysis shows that the sourcing location in India is a priority for further analysis and engagement with Company G due to the pressures on nature in that location (e.g. water use, land use change and pollution) and the declining state of nature in India.

Example 2: Company C (Mining)

As in Example 1, if the investor considers locations within the top 20% of values as high risk, then Company C's mine in Brazil could be categorised as High risk due to the fact that nature-related physical risks relating to dependencies on atmosphere, habitats and water are all potentially high (i.e. they are in the top 20% of values for each data source). Additionally, overall natural capital in Brazil is being depleted to a high degree and there is potential for the mine to impact on both natural habitats and species at risk of extinction. Finally, pressures on nature such as water use and solid waste are medium-to-low (i.e. around the middle of the range of values) and warrant further investigation through engagement with the company to ensure it is not contributing to these pressures.

Similarly, Company C's distribution centre in California could be categorised as Medium-to-High risk given high potential pressures on nature (e.g. water use and solid waste being in the top 20% of values), and potential for medium-to-high physical risks stemming from dependencies on atmosphere, habitats, and water (all in the top 20% of values). Additionally, while there is medium risk of impacting on natural habitats (due to lower prevalence of the latter), the overall state of nature is being degraded to a medium-to-high degree in California and there is potential for the distribution centre to overlap with areas important for species at risk of extinction.

The analysis shows that:

> The mine in Brazil is a priority for further analysis and engagement with the company due to the pressures on nature in that location (e.g. land use change, atmosphere depletion, and water use) and the overall declining state of nature in Brazil.

> The distribution centre in California is a priority for further analysis and engagement with the company due to the pressures on nature such as water use, solid waste, and potential spread of invasive species.

STEP 3

The investor validates the insights gathered from Step 2 and fills any remaining knowledge gaps. The investor formulates an engagement strategy for each company.

For Company G (Apparel) this includes acquiring:

- Detailed location data for sourcing of materials
- Site-level information on the state of nature to fully understand nature-related risks
- Impact management practices at the sourcing location.

Engagement with the company should also seek to clarify progress made towards the 2018 cotton sourcing commitment and identify any further management practices the company has in place to ensure it is minimising nature-related risks at the sourcing location.

For Company C (Mining) this includes acquiring:

- Location of the distribution centre in California
- Details on the pressures exerted by the distribution centre in California
- Site-level information on the state of nature at the mine in Brazil
- Impact management practices at both locations.

Engagement with the company should also seek to understand what processes it has in place to ensure it is reducing its land use change, water use, invasive species, and pollution-related pressures in both Brazil and California.

4

Conclusions and recommended actions

To manage nature-related risks, financial institutions should first focus on identifying priority industries and then adopt a staged approach to gathering data. This investor guide presents two key steps that support financial institutions with initial risk screening: by highlighting industries with the highest impacts and dependencies on nature and presenting tools and datasets to screen companies for nature-related risk exposure. In the third step, investors should seek to respond to risks by applying the knowledge gained to their financial decision-making.

While there are still data-related obstacles to overcome, there are already many relevant datasets and tools available to allow financial institutions to understand nature-related risks and opportunities within their portfolios. Data collected to assess climate-related risks can also be repurposed to support action on nature-related risk. Financial institutions should start to collect information using these tools as early as possible to inform their financial decision making and manage emerging nature-related risks.

How can financial institutions integrate nature data into Environmental, Social, Governance (ESG) screening processes today?

- Identify priority industries in your portfolio (those with the largest impacts and dependencies on nature).
- Understand the impacts and dependencies of these priority industries and start to identify specific business risks associated with those impacts and dependencies.
- Undertake a first-cut assessment of these risks within your portfolio:
  - Start with data already collected such as that used for climate-related risk analysis and TCFD reporting.
  - Then consider additional data, drawing from available resources listed in this guide.
- Apply the knowledge gathered from the above to inform financial decision-making, including stewardship.
- Signal to companies that they need asset-level (location specific) data given that assessments of nature-related risks are highly context specific.

Without asset-level data, when financial institutions come to assessing and reporting on their nature-related risks, their results will be coarse and may mask granular areas of higher risk. As a result, they will need to act in accordance with the precautionary principle (e.g. applying additional due diligence when uncertainty is greater and asset-level data is lacking).

4

Annexes

The review of datasets carried out for this investor guide builds from five of the TNFD's nine characteristics of decision-grade data. It also draws on previous data reviews undertaken as part of the Aligning Biodiversity Measures for Business collaboration. Each dataset or tool was categorised according to the following criteria:

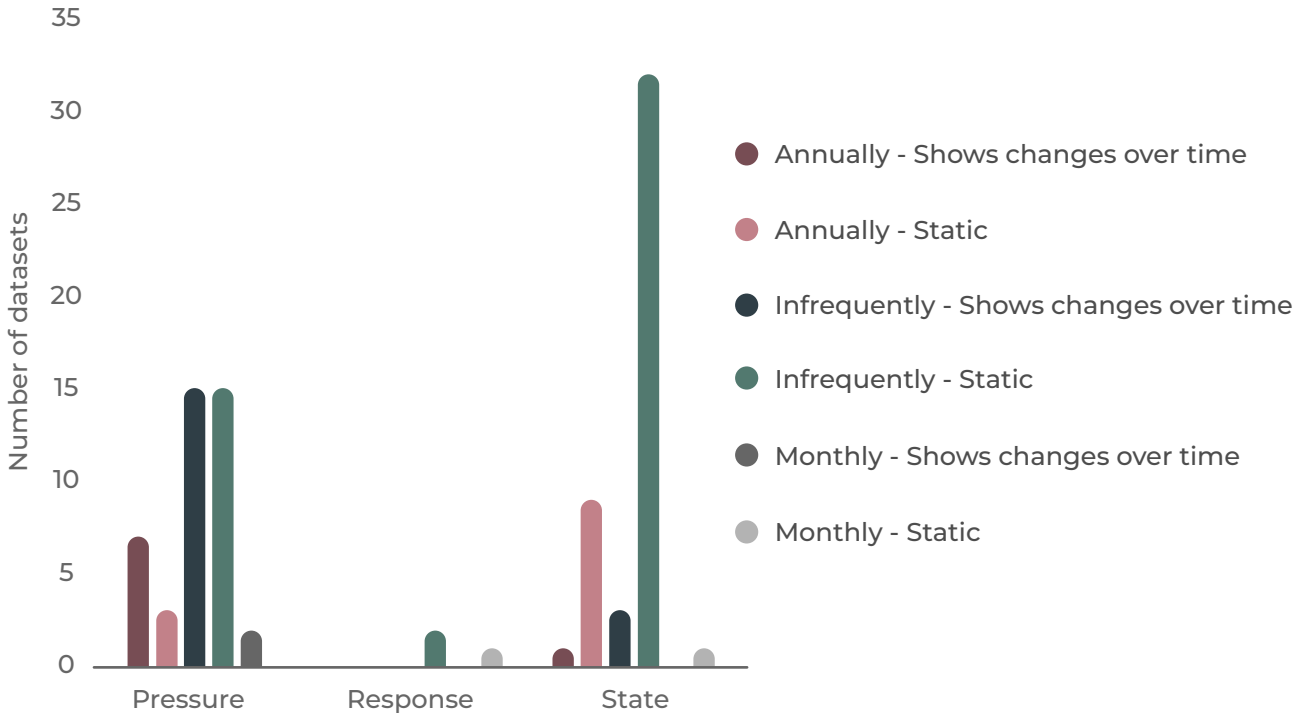
- Thematic coverage (specifically whether it covers one of terrestrial, marine or freshwater components of nature only, at least two of these components or all three)
- Temporality (whether it is a static dataset, shows changes over time, or shows past, present, and future data)
- Accessibility (whether it is open-access and free, has limited functionality available open- access, or whether it is commercial)
- Frequency of update (whether it is updated monthly, annually, or infrequently)
- Authoritativeness including traceability (whether there is a peer-reviewed and traceable method, it is not peer-reviewed but traceable, or it is not peer-reviewed or traceable)

The scale at which the dataset provides information (for example sector, sub-sector, or company level) was also reviewed, however with the analysis currently focusing on non-commercial tools and datasets there are very few datasets and/or tools that provide information at these scales. A large number of commercial datasets do also exist and are made available to financial institutions by, for example, ESG data providers. These datasets tend to include information on companies' pressures on nature (e.g. land use, toxic emissions & waste), as well as their potential responses to nature-related risks (e.g. waste management strategies).

Overall, 91 open access or partly open access datasets were identified, with 46 state datasets, 42 pressure datasets, and 3 response datasets. The majority of datasets cover just one realm (terrestrial or marine), are static layers (although 28 datasets show changes over time), open-access and free, updated infrequently (although 24 are updated annually or monthly), and have a peer-reviewed and traceable method (Figure 13). There are very limited datasets for understanding responses to pressures on nature or changes in the state of nature. An understanding of an organisation's management response should primarily be collected through disclosures (including any that are collated by ESG service providers), followed by customer/investee engagement. As shown in Figure 13, certain data gaps do remain that need to be filled through adequate investment of resources. However, there is already a significant amount of data that can be used by financial institutions to start to assess nature-related risks within their activities. A non-exhaustive review identified at least 51 proprietary data sources from ESG service providers covering nature-related information, many of which will already be available to financial institutions.

Figure 13

Number of datasets by State, Pressure and Response for assessing nature-related risks. This figure also shows how many datasets are updated annually, monthly or infrequently, and whether the datasets are static or show changes over time.



References

[1] Global Balance and PRI, Investor action on biodiversity: Discussion paper, 2020

[2] TNFD, The TNFD Nature-related Risk & Opportunity Management and Disclosure Framework - Beta v0.1 Release, 2022.

[3] See recent examples from: Investment Week, 'More emissions than Exxon': Is meat the next target for divestment?, 2021; Financial Times, Lex in depth: the $900bn cost of 'stranded energy assets, 2020; Lloyd's, Stranded Assets: The transition to a low carbon economy. Overview for the insurance industry, 2017.

[4] Finance for Biodiversity Initiative, The Climate-Nature Nexus Implications for the Financial Sector, 2021.

[5] For example, Swiss Re Institute, Habitat, water security and air quality: New index reveals which sectors and countries are at risk from biodiversity loss, 2020.

[6] TNFD, Proposed Technical Scope – Recommendations for the TNFD, 2021.

[7] Natural Capital Coalition, Data use in natural capital assessments - Assessing challenges and identifying solutions - Summary Report, 2019.

[8] Global Balance and PRI, Investor action on biodiversity: Discussion paper, 2020.

[9] For example, by the European Commission, Align Project – Aligning accounting approaches for nature, 2021.

[10] WWF, Assessing Portfolio Impacts - Tools to Measure Biodiversity and SDG Footprints of Financial Portfolios, 2021.

[11] TNFD, The TNFD Nature-related Risk & Opportunity Management and Disclosure Framework - Beta v0.1 Release, 2022.

[12] NB with the exception of food and beverages and chemicals, this list doesn't consider supply chain impacts and dependencies.

[13] UN Environment Programme, UNEP Finance Initiative and Global Canopy, Beyond 'Business as Usual': Biodiversity targets and finance. Managing biodiversity risks across business sectors, 2020.

[14] ENCORE website, 2021.

[15] WEF, Nature Risk Rising: Why the Crisis Engulfing Nature Matters for Business and the Economy, 2020.

[16] Trucost, Natural Capital at Risk: The top 100 externalities of business, 2013.

[17] SASB, SASB Materiality Map, 2018.

[18] Allianz Global Corporate & Specialty, Measuring and Managing Environmental Exposure, 2018

[19] OECD, OECD Due Diligence Guidance for Responsible Business Conduct, 2018.

[20] Further details available on the ENCORE website – Data and Methodology – Natural Capital Assets, 2021. While ecosystem services provide the actual benefits to the economy and society, data on their state and pressures affecting their provision are relatively poor at a global scale. However, such data is more readily available for the natural capital assets that provide ecosystem services.

[21] Resource exploitation includes water use.

[22] Many of these datasets are collectively available in web-based tools to ensure they are accessible; some have been developed directly for use by financial institutions. UNEP-WCMC, Biodiversity Indicators for Site-based Impacts, 2020.

[23] UNEP-WCMC, Biodiversity Indicators for Site-based Impacts, 2020.

[24] Drivers identified in the IPBES Global Assessment, 2019.

[25] Task Force on Climate-related Financial Disclosures, 2020 Status Report.

[26] Natural Capital Coalition, Connecting Finance and Natural Capital: A Supplement to the Natural Capital Protocol, 2018.

[27] UN PRI, Driving meaningful data: financial materiality, sustainability performance and sustainability outcomes, 2020.

[28] More sophisticated tools require more granular data, particularly locations of operations. This is a key difference when addressing nature-related risks and opportunities compared to climate-related risks and opportunities. Financial institutions are strongly encouraged to collect location-specific data. While this data is being collected, certain other tools can be used in the meantime to gain insights into nature-related risks and opportunities.

[29] Readers should note that while these datasets and tools are useful for initial high-level screening, their results should be validated using on-the-ground assessments to identify actual risk, rather than potential risk.

The Climate-Nature Nexus

An investor guide to expanding from climate- to nature-data

UN environment programme

WCMC

FINANCE FOR BIODIVERSITY Initiative