Benefit Accounting of Nature-Based Solutions for Watersheds

May 2024

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Overview of project

- Develop a **standardized method, guide** and **tool** to account for the stacked **water, carbon, biodiversity** and **socio-economic benefits** of NBS for **watersheds**.

Landscape assessment

Method

NBS Guide

SEG Guide

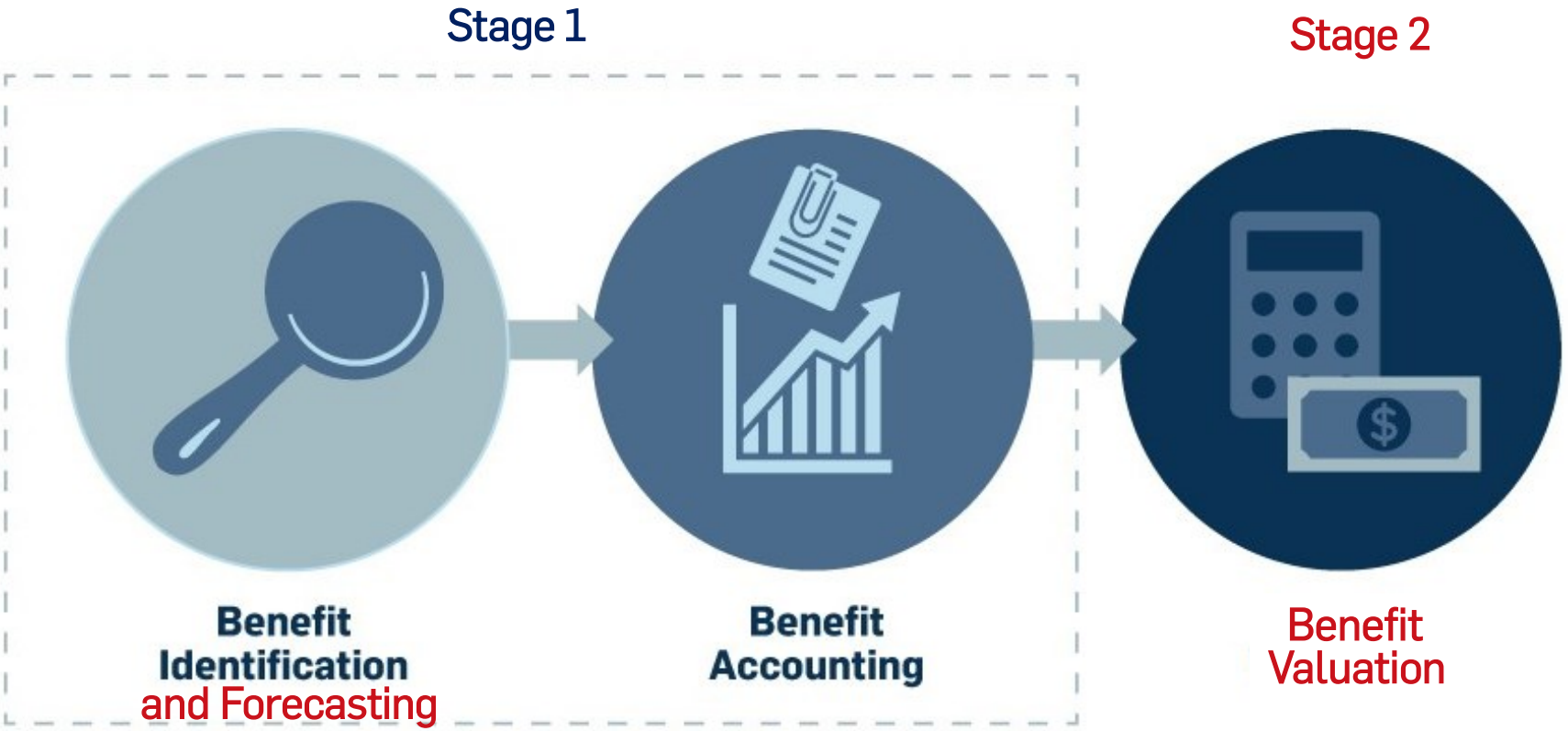
Tool

- Primary audience - private sector decision makers.
- Secondary audience - public sector, NGOs, civil society, investment organizations, development banks, academia, local communities

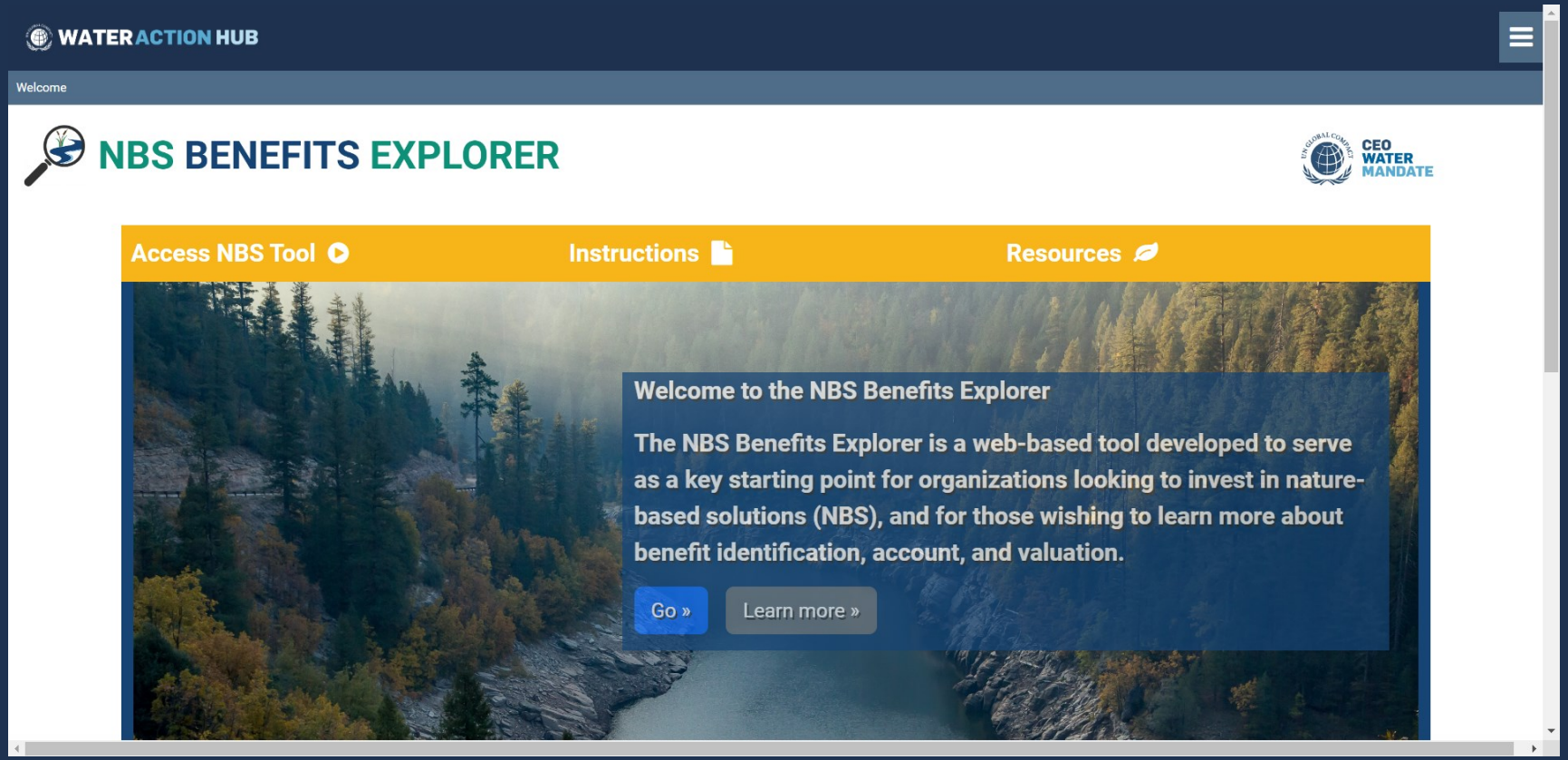
www.ceowatermandate.org/nbs

www.NBSBenefitsExplorer.net

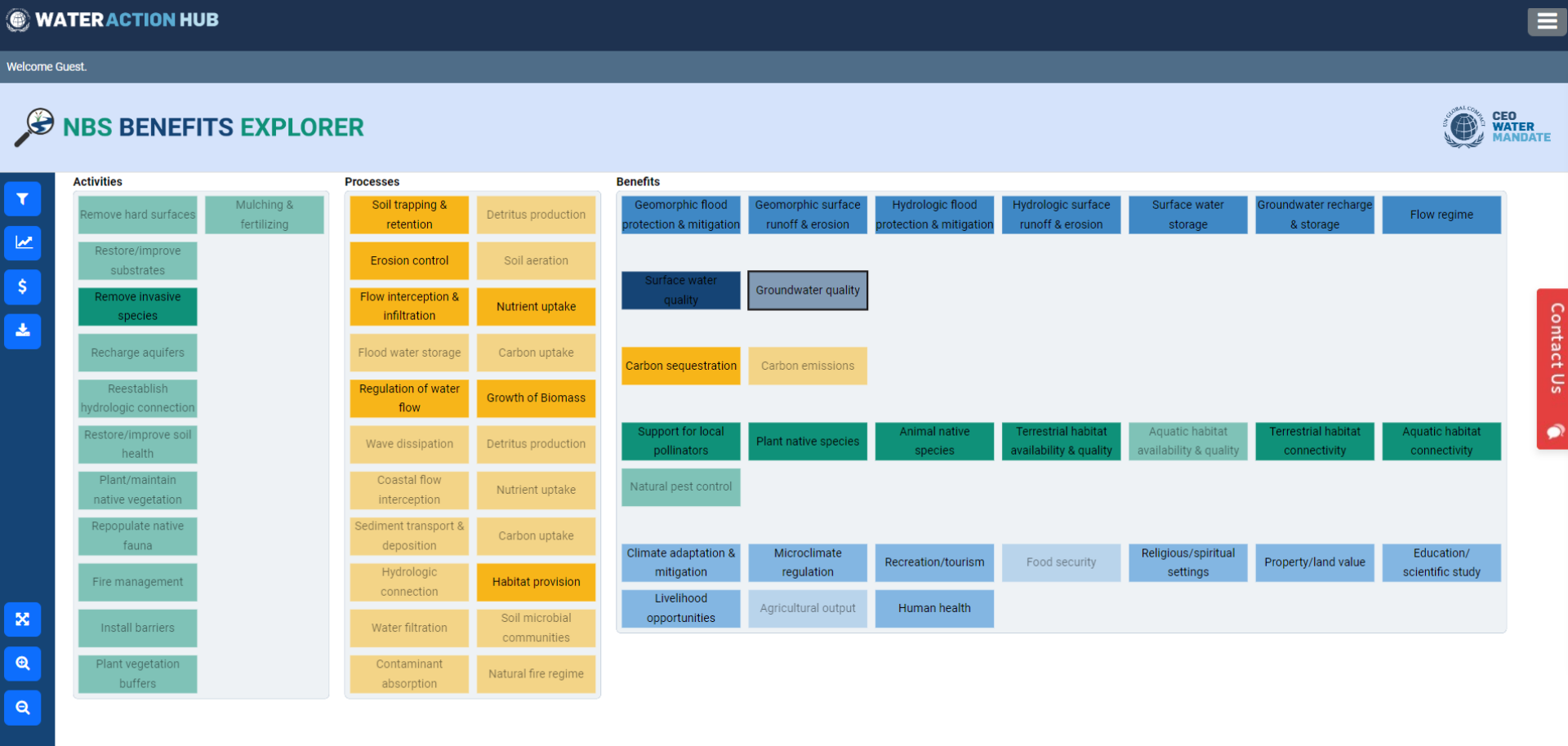
Building the business case for NBS



The NBS Benefits Explorer v2



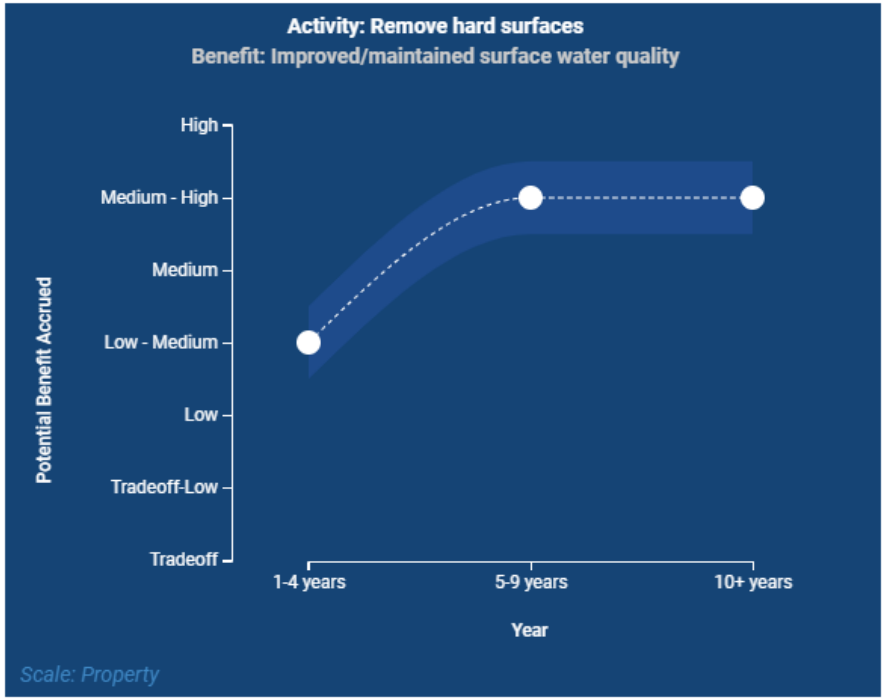
Benefit identification



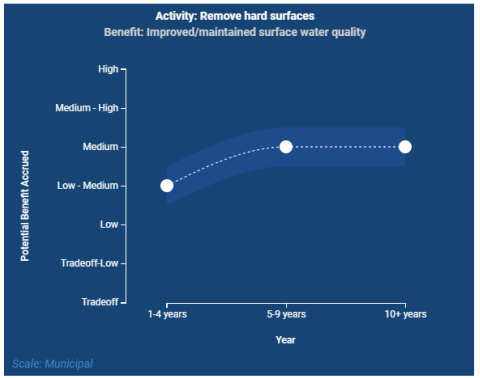
Benefit Forecasting

Remove hard surfaces - **Improved/maintained surface water quality**

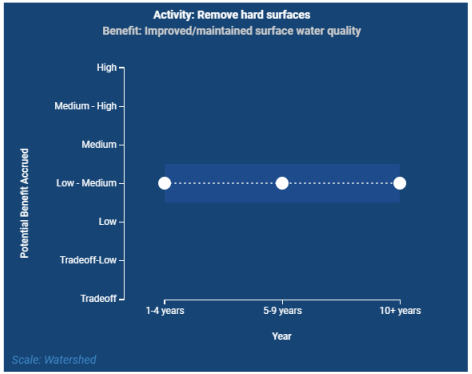
Property scale



Municipal scale



Watershed scale



Benefit Forecasting

Activity Category	Activities list	Geomorphic flood protection & mitigation (LB1)								
		Property			Municipal			Watershed		
		1-4 yrs	5-9 yrs	10+ yrs	1-4 yrs	5-9 yrs	10+ yrs	1-4 yrs	5-9 yrs	10+ yrs
Store rainwater	Build retention/detention ponds, rain gardens, swales, diversion channels; rainwater harvesting									
Construct treatment systems	Construct treatment wetlands									
Recharge aquifers	Build retention/detention ponds, infiltration ponds; dig wells; remove hard surfaces; undertake artificial recharge									
Reestablish hydrologic connection	Re-wet historical wetlands; undertake flood-plain inundation, channel reconnection; install bioswales and permeable surfaces									
Remove hard surfaces	Remove roads, pavements, canals	Medium	High	High	Low - Medium	Low - Medium	Low - Medium	Low	Low	Low
Remove hard structures/barriers	Remove berms, seawalls, weirs, dams									
Restore/improve soil health	Increase organic matter, carbon content; enhance earthworm populations, microbial activity; increase plant diversity; improve soil chemistry/pH									
Restore/improve/stabilize substrates	Fix erosion; add natural structures, stabilize slopes, rapid dumps; provide substra							Low - Medium	Low - Medium	Low - Medium
Dredge substrate	Remove sedim exchange or co groundwater;									
Plant/restore/maintain native vegetation	Plant trees and restore habitat							Low - Medium	Low - Medium	Low - Medium
Repopulate native fauna	Reintroduce or influence ecos									
Remove invasive (or aggressive indigenous) species	Remove foreig evapotranspira							Tradeoff-Low	Low - Medium	Low - Medium
Brush control	Reduce fuel lo enough light	Tradeoff-Low	Low	Low	Low	Low	Low	Low	Low	Low
Fire management	Restore natural fire regime	Tradeoff-Low	Low	Low	Low	Low	Low	Low	Low	Low
Avoided habitat conversion	Implement conservation easements; purchase land for conservation									
Reduced/avoided resource abstraction	Implement legal and financial transactions/mechanisms									
Install barriers	Install fences, wire, grids to reduce livestock/animal impacts; reduce unwanted herbivory, foot traffic	Low - Medium	Low - Medium	Low - Medium	Low	Low	Low	Low	Low	Low
Introduce grazing management systems	Undertake silvopasture, rotational grazing									
Implement terraced/contour planting	Follow natural gradients of landscape/no levelling of slopes									
Plant vegetation buffers	Plant cover crops, grass strips, hedge rows, riparian buffers, trees in croplands									
Mulching and fertilizing	Distribute animal manure, biochar, organic matter; build compost pits; undertake conservation tillage									

+-1500 entries per habitat-intervention category

TOTAL: 49 500 data points

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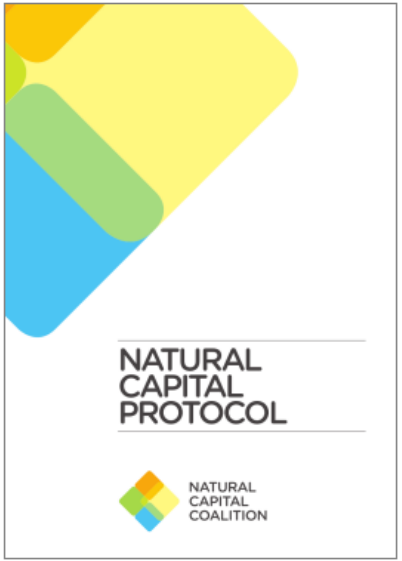
CEO WATER MANDATE

Benefit Valuation

Benefit	Change in the environment	Change in value to society
Water quantity	Average m3 returned to nature from different NBS	Avoided risk (water is available to other users)
Water quality	Average change in pollutant concentration from different NBS (currently Nitrogen)	Avoided cost of treating diffuse pollution
Flood protection	Change in flood parameters (extend, depth, frequency)	Avoided damages to man-made infrastructure
Carbon sequestration	Changes in land use (types of vegetation) IPCC Tier 1 estimate of change in GHG	Carbon pricing (different options)
Recreation	Value transfer (based on key project characteristics)	
Biodiversity	Hectares of ecosystem restored	Global average value of "nursery" ecosystem service



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Benefit Valuation

SROI figures by theme:

- Water quantity
- Water quality
- Carbon
- Biodiversity
- Recreation*

* Used as a proxy for socio-economic benefits

NEXT STEPS

Building the business case for NBS

Agricultural lands

Estuaries and deltas

Forests

Grasslands

Lakes and ponds

Mangroves

Rivers and floodplains

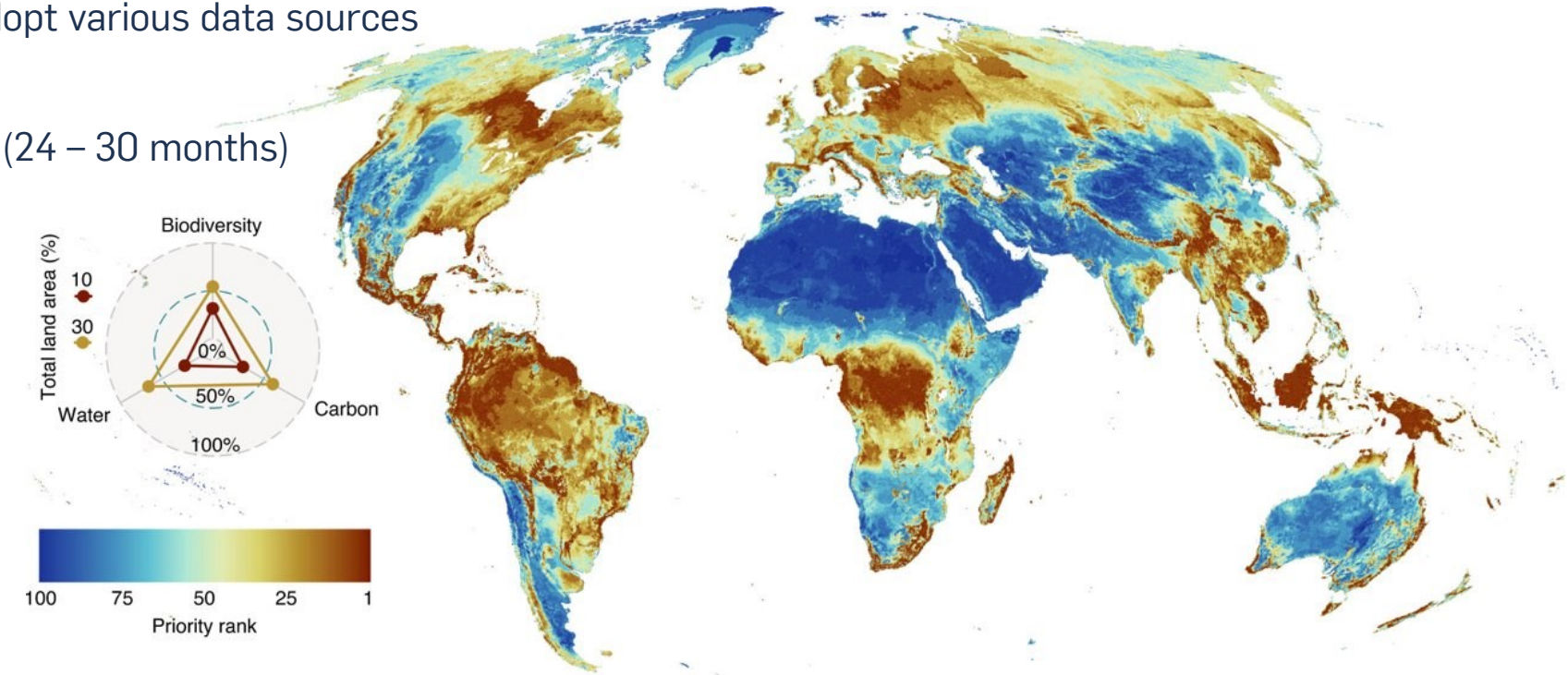
Urban

Wetlands

Stage 3: Spatial considerations (2024 – 2026)

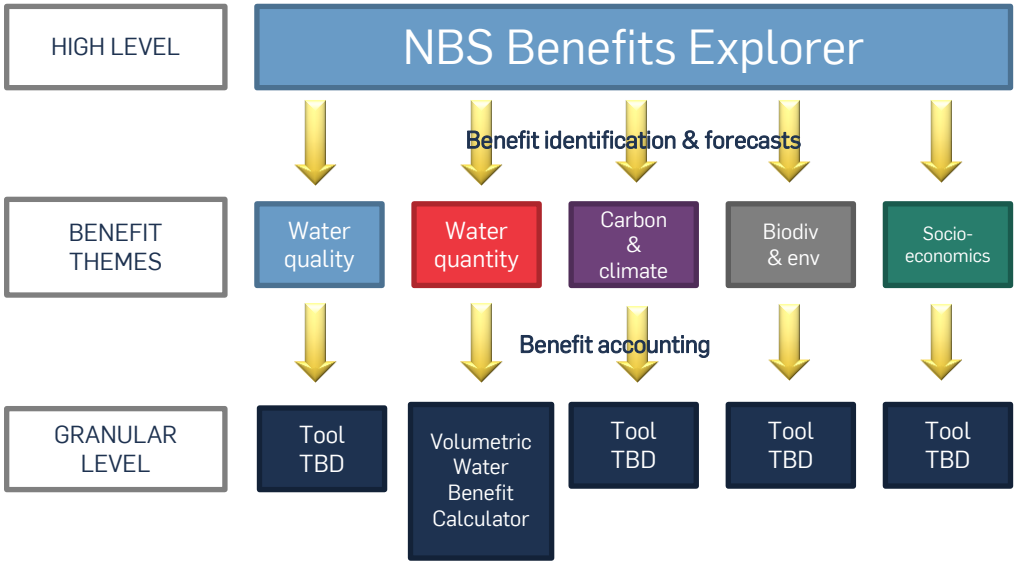
- Add spatial element to the tool – Consider priority areas for water, biodiversity and carbon
- To show where investments in NBS can make biggest impact
- Can support collective action initiatives
- Will adopt various data sources

- $425k (24 – 30 months)



Stage 3: Tool deep dives

- Consider deep dive capabilities to assess, measure and model water quality, water quantity, carbon and climate, biodiversity and the environment, and potentially socio-economics data at the site level (post-NBS implementation)
- Will start with adopting Volumetric Water Benefit Calculator for water quantity assessments
- Other potential partnerships/tools:
  - **Water quality** (TNC, LimnoTech, Blue Risk)
  - **Carbon and climate** (Gold Standard, UNFCCC)
  - **Biodiversity and the environment** (TNC, WWF, Conservation International, BirdLife, Ramsar)
  - **Socio-economics** (UNECE, World Bank)
- $ vary (24 – 48 months)



Benefit Identification | **Benefit Accounting** | **Benefit Valuation**

NBS Benefits Explorer

Prefeasibility and design stages

Benefit identification & forecasting

- Water quantity
- Water quality
- Carbon & climate
- Biodiv & env
- Socio-economics

Benefit valuation

- Water quantity
- Water quality
- Carbon & climate
- Biodiv & env
- Socio-economics

Implementation and M&E stages

Benefit accounting

- Volumetric Water Benefits Calculator
- Water Quality Benefits Calculator
- Carbon Benefits Calculator
- Biodiversity Benefits Calculator
- Tool TBD

Benefit valuation

- Water quantity
- Water quality
- Carbon & climate
- Biodiv & env
- Socio-economics

Stage 3 additions

Ultimate goals

- Provide greater clarity to organizations looking to invest in NBS
  - Help identify the benefits accrued across different habitats (high level and project-specific)
  - Indicate when and where potential benefits will occur
  - Estimate costs and benefits
  - Provide indicators and calculation methods to quantify outputs after implementation
- Provide a means to capture data and calculate specific benefits across thematic areas
- Suggest basins where NBS benefits would have the greatest potential impacts

Thank You

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