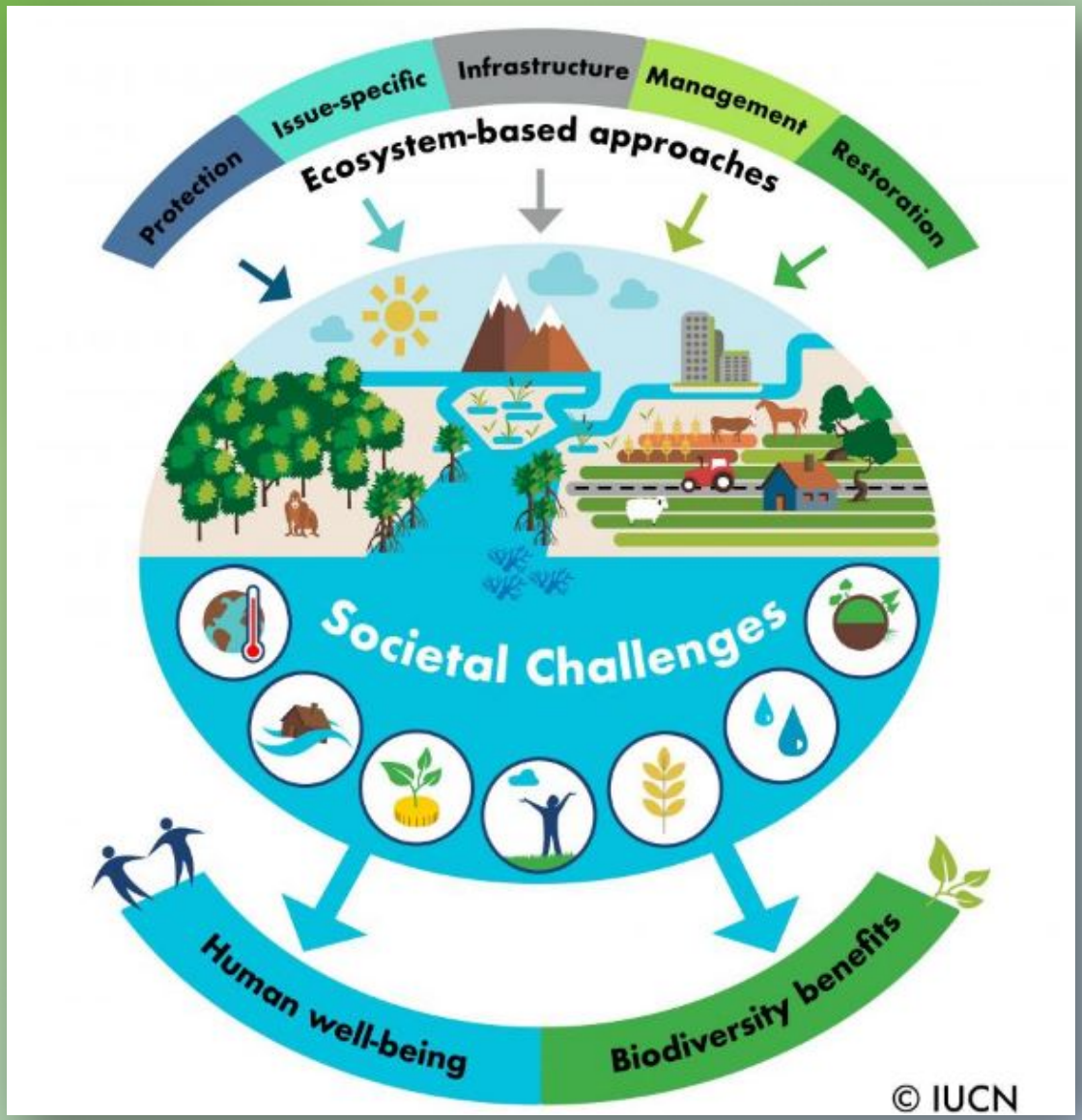


NbS: Nature-based Solutions

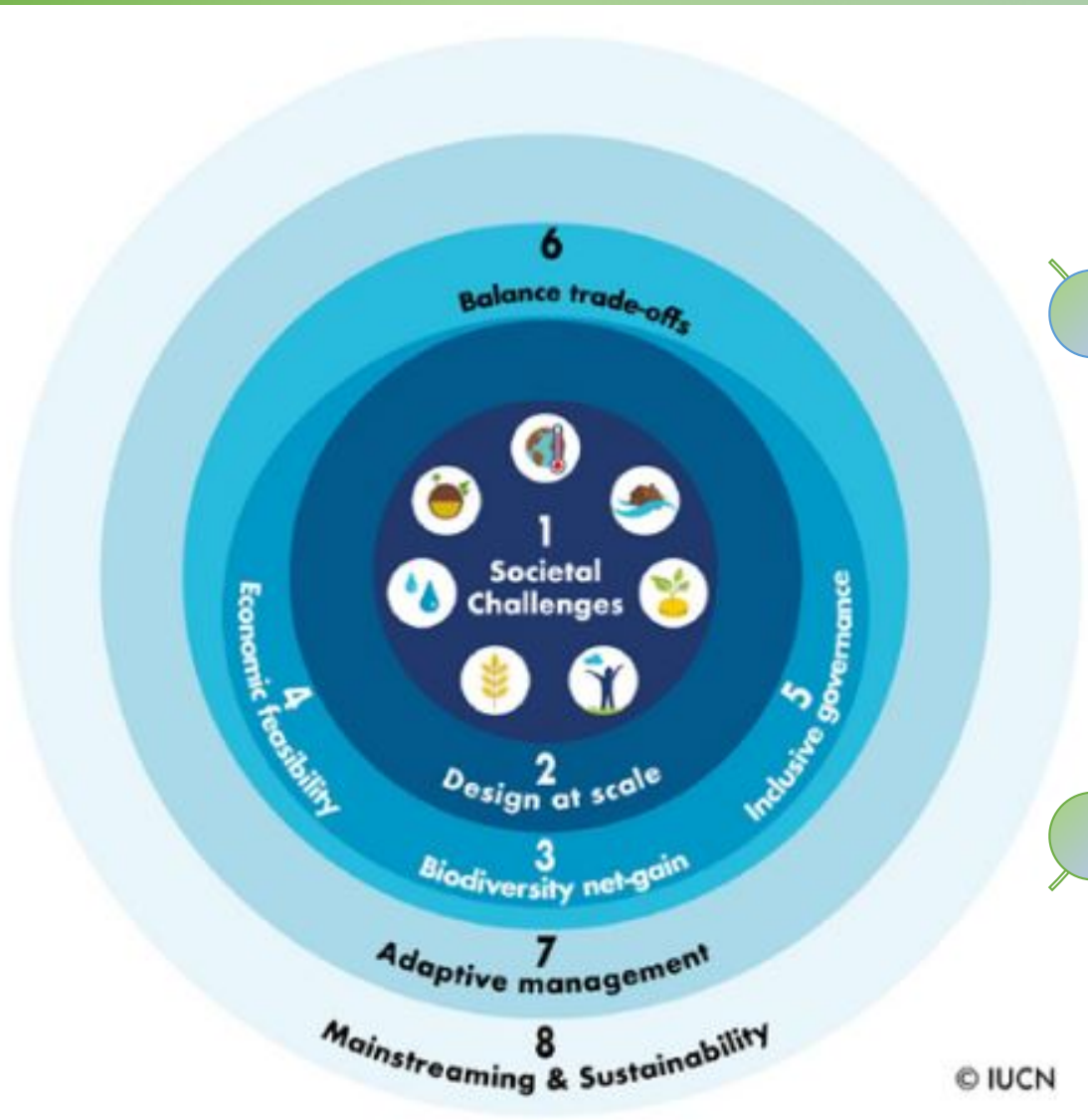
are actions to protect, conserve, restore, sustainably use and manage natural or modified terrestrial, freshwater, coastal and marine ecosystems which address social, economic and environmental challenges effectively and adaptively, while simultaneously providing human well-being, ecosystem services, resilience and biodiversity benefits

~ UNEP (2022)

They include practices and strategies such as:

- ➔ NCS: Natural Climate Solutions
- ➔ EbA: Ecosystem-based Adaptation
- ➔ NI: Natural Infrastructure
- ➔ FLR: Forest Landscape Restoration
- ➔ Eco-DRR: Ecosystem-based Disaster Risk Reduction
- ➔ Agroecology: polyculture, permaculture, & agroforestry
- ➔ Ecosystem management, restoration, & conservation

Global standards for NbS



Include addressing societal challenges:

- Climate change mitigation & adaptation
- Disaster risk reduction
- Economic & social development
- Human health
- Food & water security
- Environmental degradation & biodiversity loss

Natural Climate Solutions (NCS)

are actions that increase carbon storage and/or avoid greenhouse gas emissions by conserving, restoring, or improving the use or management of ecosystems.

While maximizing the climate mitigation potential of nature, they also provide co-benefits including:

- *Improved soil*
- *Improved air and water quality*
- *Increased biodiversity habitat*
- *Increased resilience to climate change*

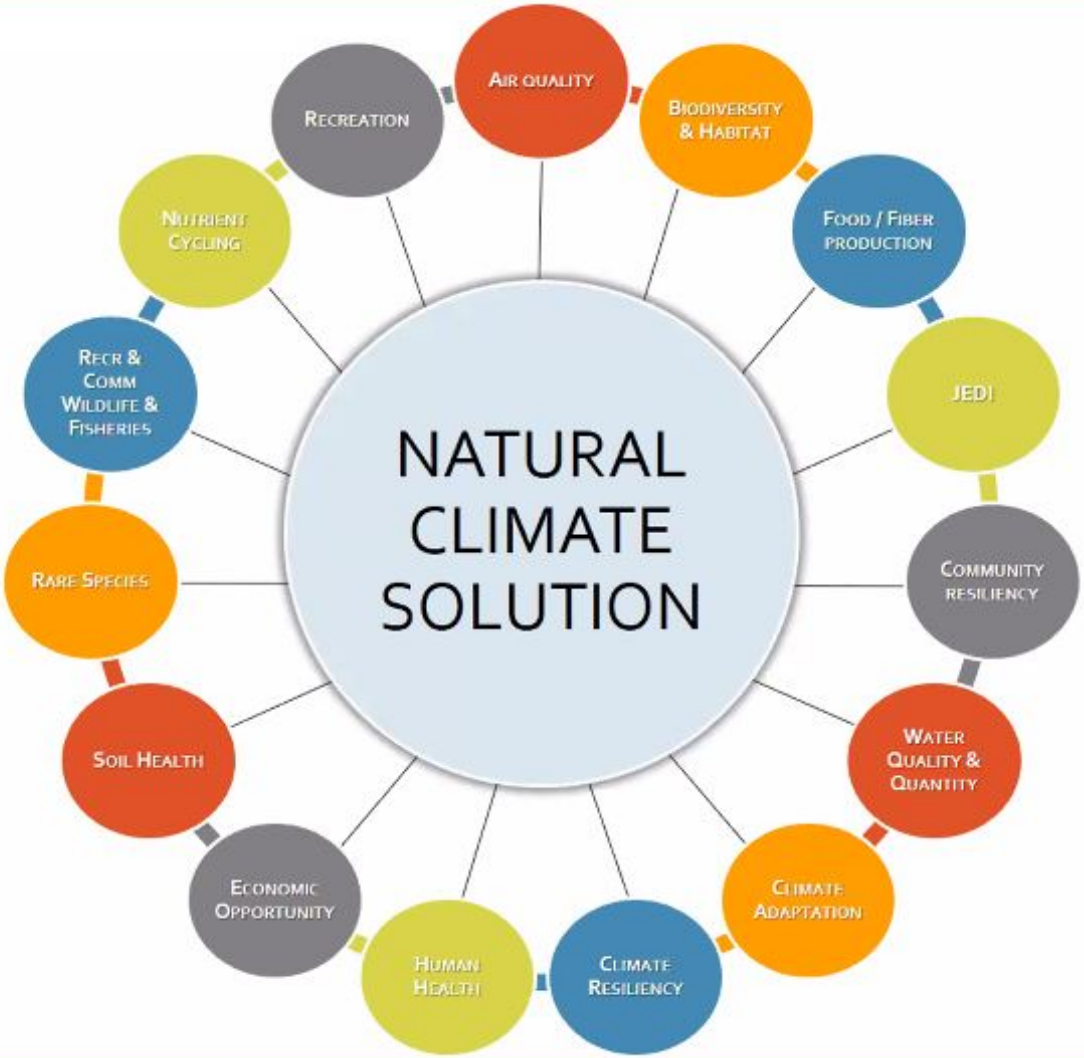
Forests & Woodlands	• Reforestation • Avoided Forest & Woodland Conversion • Natural Forest Management • Improved Forest Plantations • Deferred Timber Harvest • Avoided Wood Fuel Harvest • Fire Management
Agriculture	• Biochar • Nutrient Management • Compost Amendments • Cover Crops • Trees in Croplands *aka* Agroforestry • Conservation & Regenerative Agriculture • Grazing: Animal Management / Legumes / Improved Feed / Optimal Intensity • Improved Manure Management • Improved Rice Cultivation
Grasslands & Shrublands	• Grassland Restoration • Avoided Grassland Conversion • Sagebrush Restoration • Avoided Sagebrush and Brushland Conversion
Riparian Reforestation	• Interior and Coastal
Urban	• Reforestation • Grassland/Pollinator Restoration
Wetlands & Peatlands	• Peatland Restoration/Re-wetting • Avoided Peatland Impacts/Loss • Avoided Coastal Wetlands Impacts/Loss • Tidal Wetland Restoration & Reconnecting/Re-wetting
Intertidal Zone	• Seagrass Restoration • Avoided Seagrass Loss

Compiled from: Griscom, et al. (2017) Natural Climate Solutions. https://www.pnas.org/content/114/44/11645 • Cameron, et al. (2017) Ecosystem Management and Land Conservation can Substantially Contribute to California's Climate Mitigation Goals. https://www.pmas.org/content/114/48/12833 • Fargione, et al. (2018) Natural Climate Solutions for the United States. https://advances.sciencemag.org/content/4/11/eaat1869 • Graves, et al. (2020) Potential Greenhouse Gas Reductions from Natural Climate Solutions in Oregon, USA. https://journals.plosone/article?id=10.1371/journal.pone.0230424 • USFWS Climate Change Adaptation Program and Nature-based Solutions for Forest Adaptation (2022) https://www.forestadaptation.org/learn/training-and-workshops

What are "co-benefits" of climate mitigation?

Co-benefits of climate change mitigation are the positive benefits related to the reduction or avoided loss of greenhouse gases

(IPCC AR4)



SOURCE: USFWS Climate Change Adaptation Program and Nature-based Solutions for Forest Adaptation (2022) https://forestadaptation.org/learn/training-and-workshops

Primary NbS Benefits Identified in the NbS Benefits Explorer

BIODIVERSITY & ENVIRONMENT

Improved/maintained:

- Aquatic habitat availability & quality
- Terrestrial & aquatic habitat connectivity
- Support for local pollinators
- Natural pest control
- Abundance and diversity of native plant & animal species

Improved/increased terrestrial habitat availability & quality (including soil health)

WATER QUALITY & QUANTITY

Reduced/avoided surface runoff & associated erosion

Improved/maintained:

- Surface water storage
- Groundwater recharge & storage
- Flow regime
- Flood protection and mitigation (inland & coastal)
- Surface water & ground water quality

SOCIO-ECONOMICS

Improved/maintained:

- Climate adaptation & mitigation
- Livelihood opportunities
- Human health
- Agriculture/agricultural output
- Religious/spiritual settings
- Microclimate regulation
- Food security
- Recreation/tourism opportunities
- Property/land value
- Opportunities for education/ scientific study

CARBON

Improved/maintained carbon sequestration

Reduced carbon emissions

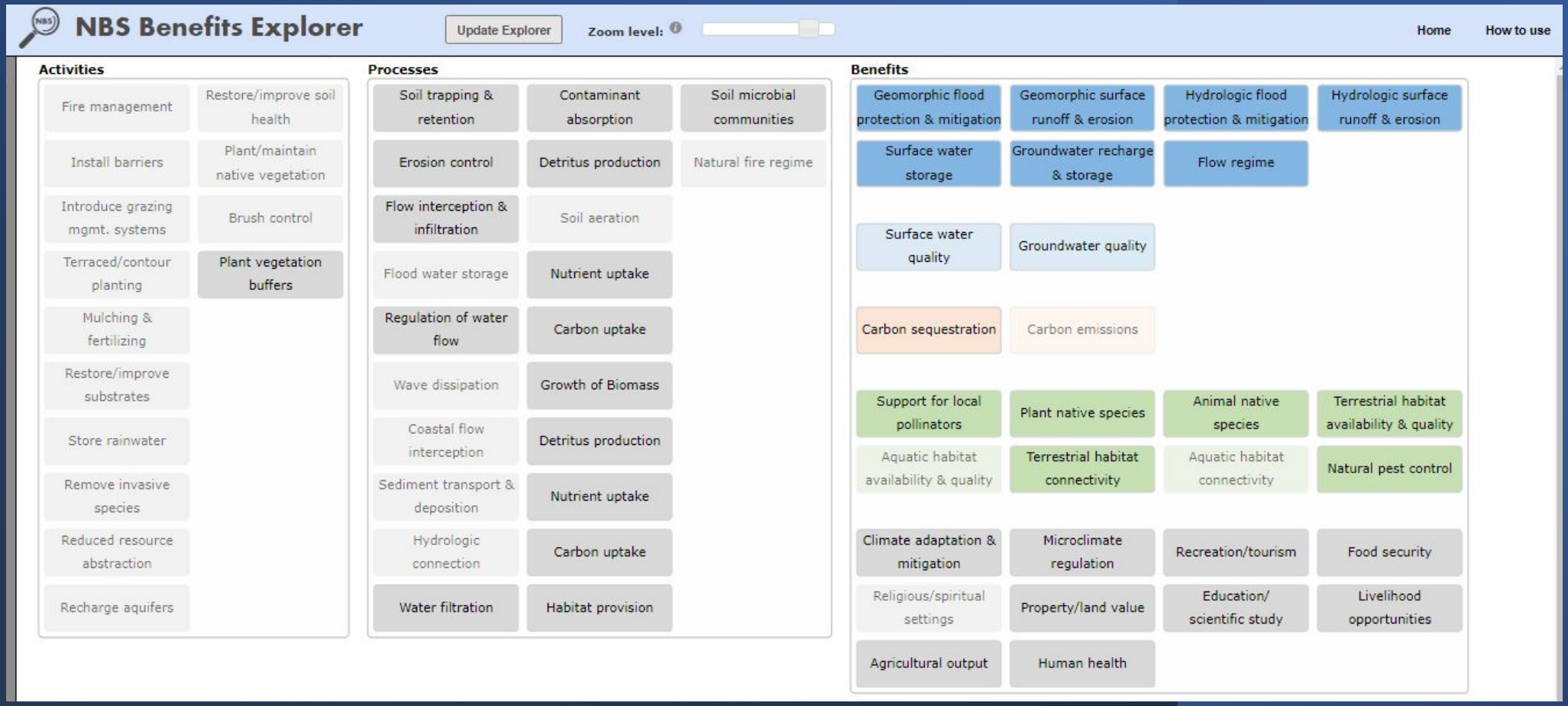
Brill, Gregg, et al. (2021). Benefit Accounting of Nature-Based Solutions for Watersheds: Guide *United Nations CEO Water Mandate and Pacific Institute*. Oakland, California. www.ceowatermandate.org/nbs/guide (from Table 4)

NbS Benefits Explorer Tool

Results for “Plant Vegetation Buffers” from Agricultural Management

(Hovering over selected activities, processes, or benefits provides additional details.)

nbsbenefitsexplorer.net



More learning ahead…

Minimum Standards Required by the VCM:

Additionality: "Reduction/sequestration must be additional to any that would occur without the project."

Permanence: Relating to length of storage & risk of loss

Leakage: Unintended greenhouse gas (GHG) emissions that may result directly or indirectly from the project

Co-Benefits: Environmental &/or societal benefits such as improved habitat/ biodiversity protection, water quality, training, jobs, recreation, education, reducing climate-related risks, etc.

Ecosystem Marketplace (2022). State of the Voluntary Carbon Market Q3 2022. https://www.ecosystemmarketplace.com/publications/state-of-the-voluntary-carbon-markets-2022/

Thank you!

Questions?

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Image: by Chrissie28IWish! via *The Guardian*/Environment Gallery • 5/2012