

NATURAL CLIMATE SOLUTIONS 101

Natural Climate Solutions (NCS) are actions that use nature to avoid greenhouse gas (GHG) emissions or remove carbon from the atmosphere. They include conservation, restoration, and improved land management practices.

NCS are an essential part of global climate action because they have the potential to deliver one-third of the annual emissions reductions needed by 2030 to stabilise warming below 2°C¹, making a critical contribution to meeting the goals outlined by the Paris Agreement. NCS also delivers additional ecosystem benefits such as clean air and water, enhanced soil health, reduced erosion, and habitat and biodiversity maintenance. NCS has gained momentum in recent years following the publication of a National Academy of Scientists study, which outlined the potential for NCS to provide cost effective CO₂ management and provided a foundation for NCS in climate action.

NCS and carbon markets

NCS projects are part of both compliance and voluntary carbon markets. Maximising investments in NCS will ensure that nature plays the fullest role possible in delivering the goals of the Paris Agreement. Carbon markets create important financial incentives for restoration and conservation projects that sequester more carbon than would normally occur. They can also credit reduced emissions from deforestation and degradation (REDD+).

Carbon markets rely on high integrity carbon crediting programmes, which set standards for various types of NCS actions. These standards use rigorous measurement and verification protocols for determining the amount of CO₂ equivalent a programme or project will achieve, and the performance is assessed by independent verifiers before credits are issued.

Some governments allow NCS credits to be used in compliance programmes. For example, California accepts forestry credits for compliance with the state's ETS targets, stimulating billions of dollars in investment into reforestation and forest management programs. In New Zealand, forestry is covered by the country's ETS, generating removal units which emitters can use for compliance, while Australia's Emissions Reduction Fund programme includes a variety of land-based methodologies.

Similarly, voluntary markets are an important source of funds for NCS projects. Companies can voluntarily reduce and remove their emissions by purchasing NCS credits. NCS now account for around 40% of retired carbon credits in the voluntary carbon market.

Types of NCS

1. Forests

Forests have the potential to store a quarter of all CO₂ needed to stay below 2°C of global warming¹. As outlined by the Paris Agreement, maintaining and creating carbon sinks through avoided deforestation, reforestation, and forest management strategies is critical to emissions mitigation and enhancing the ability of forests to sequester and store carbon.

Forests are also responsible for emissions, as deforestation is the largest source of emissions from the land sector. Old growth forests are the most carbon dense and are often threatened by deforestation, which is why it is important to avoid forest conversion to non-forest land and practice climate smart forestry to support large scale capture and storage. Other approaches include improved forest management, such as extending time between harvests and implementing fire control, increasing urban tree canopy, reforestation, and afforestation.

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2. Agriculture and soil

Soil-based sequestration has the potential to store three times as much CO₂ as is in the atmosphere. The potential for soil sequestration on agricultural land, which is extensively managed for crops and livestock, can be unlocked by improving farming practices. Many soils farmed using conventional methods have lost up to 70% of the CO₂ they once held because when soil is left bare or tilled intensively, the carbon is released. Regenerative agriculture practices, which seek to improve the health of the soil by rebuilding organic matter and biodiversity, enhance the ability of soil to sequester CO₂. Such processes include low or no till, cover cropping, applying compost to fields, and grazing management.

3. Blue carbon

Blue carbon refers to the sequestration and storage of CO₂ in coastal ecosystems, including mangroves, seagrasses, and marshes. These highly productive ecosystems are essential to NCS activities because they have the potential to sequester two to four times more carbon per unit area than forests, and for a longer time. This high carbon content makes protecting these ecosystems vital, as they can become significant sources of GHG emissions if degraded or lost. Projects to conserve, restore, and create wetland habitats are being implemented at sites around the world.

Additionally, carbon stock assessments are being conducted to quantify net GHG emission reductions resulting from project activities. As blue carbon projects are integrated into climate policy and existing carbon markets, further development of projects to conserve and restore wetland ecosystems will enhance the potential of blue carbon.

1. According to a Natural Climate Solutions by Griscom et al, [published in PNAS](#) in 2017.

