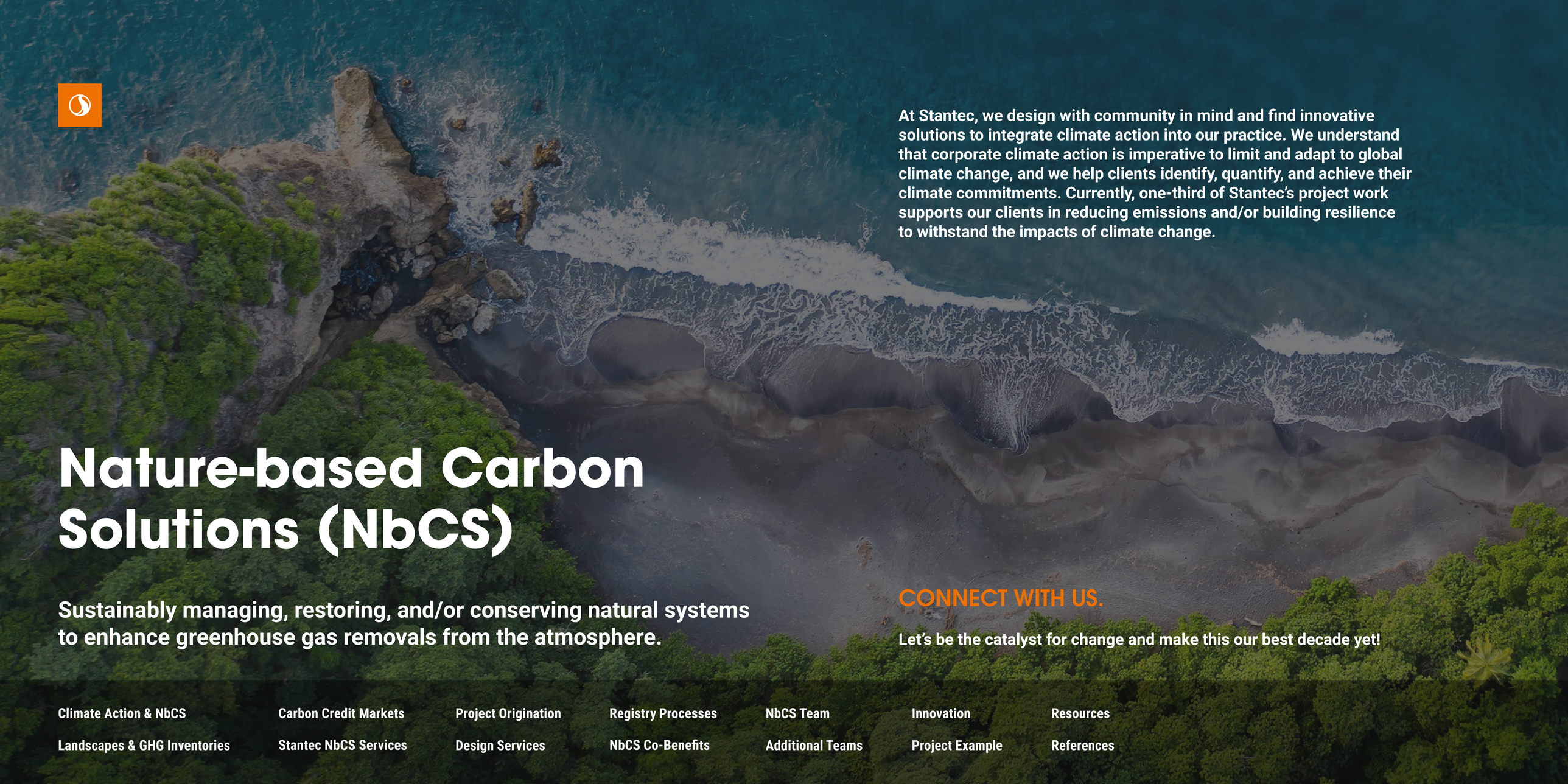

At Stantec, we design with community in mind and find innovative solutions to integrate climate action into our practice. We understand that corporate climate action is imperative to limit and adapt to global climate change, and we help clients identify, quantify, and achieve their climate commitments. Currently, one-third of Stantec's project work supports our clients in reducing emissions and/or building resilience to withstand the impacts of climate change.

Nature-based Carbon Solutions (NbCS)

Sustainably managing, restoring, and/or conserving natural systems to enhance greenhouse gas removals from the atmosphere.

CONNECT WITH US.

Let's be the catalyst for change and make this our best decade yet!

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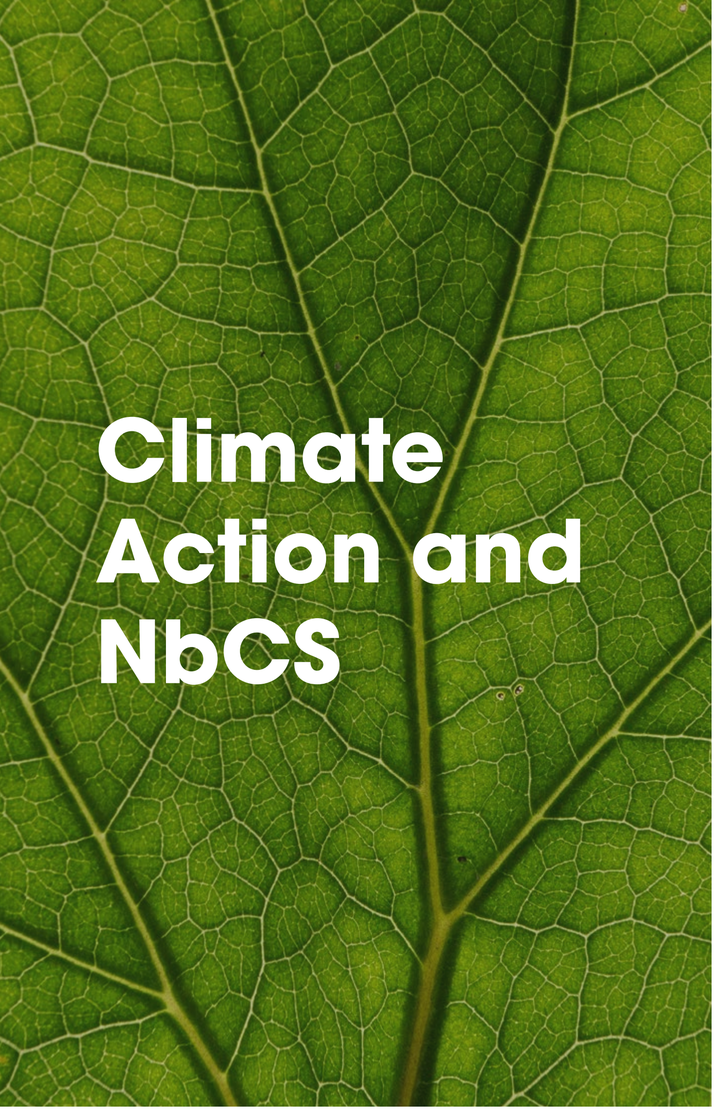
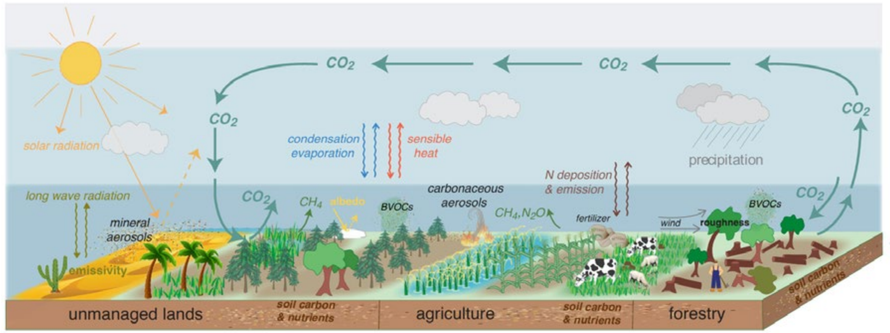


Climate Action and NbCS

Climate action involves a multifaceted approach to reduce greenhouse gas (GHG) emissions, remove atmospheric carbon dioxide (CO_2), and minimize the impact of a changing climate on the environment. This can be accomplished by incorporating Nature-based Carbon Solutions (NbCS), sometimes referred to as Natural Climate Solutions, into a climate action plan. NbCS play an integral role in reducing the amount of CO_2 in the atmosphere by enhancing carbon storage within ecosystems. NbCS can provide over one-third of the climate mitigation necessary between now and 2030 to keep climate change limited to two degrees Celsius (Griscom et al., 2017).

NbCS are designed to utilize the natural and built environment to mitigate, adapt, and build resiliency to climate change. These projects apply conservation, restoration, creation, and/or sustainable management of natural and semi-natural ecosystems to remove carbon from the atmosphere and/or reduce GHG emissions. GHGs emitted and/or stored by natural sources are referred to as landscape emissions and removals. Landscape emissions can result from of a variety of land use activities, including vegetation clearing or harvest, soil/peat excavation or tilling, changes in hydrology or salinity, and nutrient or organic matter applications such as fertilizer. These practices can result in a decrease of landscape carbon storage and increase in landscape emissions. Landscape removals occur when ecosystem components (e.g., Trees, shrubs, and soils) function as carbon sinks and sequester carbon from the atmosphere. Carbon sinks can be established, restored, or protected through restorative land use activities, like habitat restoration/enhancement, habitat creation, and sustainable land management. Examples include afforestation, reforestation, and improved forestry/regenerative agriculture.

The figure (right) demonstrates some of the land-atmosphere interactions within three types of ecosystems: unmanaged lands, agriculture, and forestry.



Land-atmosphere interactions within ecosystems in unmanaged lands, agriculture, and forestry
IPCC: Climate Change and Land

In addition to climate change mitigation and adaptation, NbCS provide climate resilience through enhanced flood mitigation, food security, and biodiversity protection. NbCS can be implemented within most habitats, spanning from inland forests and green spaces, grasslands, agriculture, and peatlands to coastal blue carbon systems, such as mangroves, tidal marshes, and seagrasses.

NbCS are innovative projects that can be integrated into climate action plans. These solutions can be carried out by (1) incorporating landscapes into GHG inventories and/or (2) leveraging carbon credit markets.

Landscapes and GHG Inventories

Companies engaging in climate action typically take steps towards understanding their climate impact through GHG inventories. GHG inventories are developed by quantifying direct (Scope 1) and indirect (Scope 2, Scope 3) emission sources. This provides an initial benchmark and subsequent annual reports showing emissions relative to previous reporting years. Components of an inventory typically include:

- Scope 1: direct GHG emissions that occur from sources that are controlled or owned by an organization (e.g., fuel combustion, boilers, vehicles, etc.).
- Scope 2: indirect GHG emissions associated with purchasing electricity, steam, heat, or cooling (i.e., upstream activities).
- Scope 3: indirect GHG emissions associated with the downstream use of products by customers (e.g., transportation and distribution, processing, use, end-of-life treatment of product by other organizations and franchises, etc.), or the upstream generation of products used by the company (e.g., business travel, employee commuting, capital goods, etc.).

Apart from emissions derived from industrial processes or energy and fuel consumption, these scopes may also include emissions and removals derived from land within an organization's portfolio. These landscape emissions and removals encompass the natural function of conserved habitats, the increase in carbon capture by restorative practices, and the impacts of operation-derived habitat loss. GHG inventories that incorporate landscapes provide a more holistic understanding of an organization's total climate impact and can identify opportunities where NbCS may be implemented.

Cabon Credit Markets

Aside from the company-wide inclusion of landscape emissions and removals in GHG inventories, organizations can utilize carbon markets as a strategy for mitigating portions of their GHG footprint. Carbon markets exist as both compliance programs and voluntary initiatives.

Compliance carbon markets are driven largely by government policy and involve entities reducing GHG emissions based on emissions caps and compensating for residual emissions by obtaining offsets or trading emissions permits (i.e., allowances) to meet regulatory requirements. Voluntary carbon markets, however, are driven largely by corporate commitments to reducing climate impacts (e.g., corporate net zero, carbon neutral) absent of, or in addition to, local or regional regulatory requirements. The voluntary market is not regulated by policy but is comprised of registries and standards setting bodies that administer carbon credits.

Carbon credits are verifiable GHG emissions reductions from certified climate projects (e.g., NbCS) used in carbon markets to mitigate for an organization's residual GHG emissions. These projects can be implemented inside (insetting) or outside (offsetting) of a company's value-chain.

Projects seeking certified credit for offsets or insets must meet requirements detailed by carbon registries. These programs provide frameworks for certification and methods for quantifying emissions reductions. For NbCS to generate certified carbon credits, a registry-approved methodology must exist that encompasses the proposed project activity. Alternatively, methods can be authored and undergo a process for approval under a particular carbon registry prior to use.

Stantec NbCS Services

We understand the value of nature! Stantec has the technical expertise to support the full lifecycle of the NbCS project process. Whether quantifying emissions and removals from land use practices, conducting project-specific climate impact assessments, restoring ecosystems, or exploring credit generation through carbon markets, Stantec supports our clients in climate action by working with nature.

Whether the business objective is part of a corporate GHG mitigation strategy or for certified carbon credits, NbCS projects often require complex design, robust documentation, and defensible GHG accounting. Particularly when exploring the compliance carbon credit markets, projects must fulfill stringent additionality requirements and undergo verifiable quantification of emissions and/or carbon sequestration for both theoretical baseline (i.e., “business-as-usual”) and project scenarios. To support clients in the daunting process of registering an NbCS project for carbon credit generation, Stantec designed a step-wise process to guide project developers from opportunity identification to credit issuance:

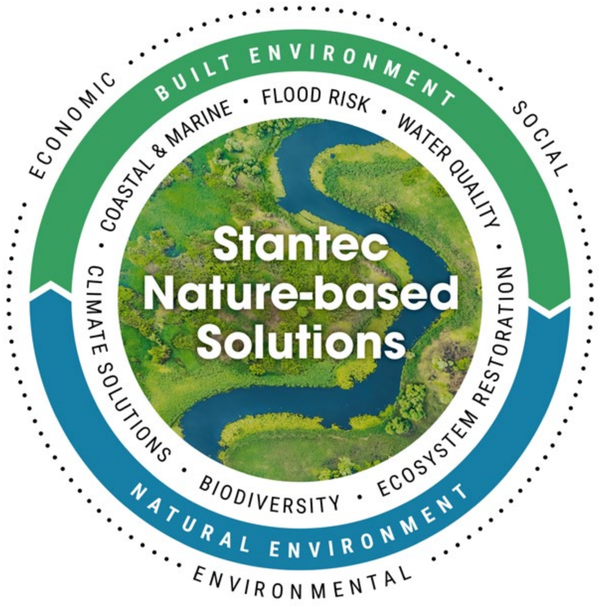
STANTEC’S SIMPLIFIED CARBON CREDITING PROCESS

1. **IDENTIFY**
   Identify the opportunities and estimate cost/credit potentials
2. **ASSESS**
   Complete feasibility study using onsite data collection
3. **APPROVE**
   Select parcels for next phase and authorize investment
4. **DESIGN**
   Design the selected projects and plan for implementation
5. **BUILD**
   Permit the projects and implement NbCS
6. **REGISTER**
   Finish registry required assessments, documentation, and reviews
7. **MONITOR**
   Monitor and maintain the project area protecting from reversals
8. **CREDIT**
   Submit data for credit issuance over the project lifespan

Project Origination

Identifying NbCS project opportunities at scale can be challenging. In Step 1, “identify,” Stantec supports clients in finding creditable project opportunities both inside and outside their properties with local- to national-level assessments. A variety of potential project areas and activities suitable for implementing NbCS are identified in an initial analysis along with anticipated costs and credit yield to estimate the scale of the opportunities. In Step 2, “assess,” these projects are further investigated with more granular, site-specific data collection and analyses to better understand anticipated project performance and aid in prioritization (e.g., high credit yield, low marginal abatement cost, high co-benefits). This assessment allows clients to make an informed investment decision under Step 3, “approve.”

Design Services



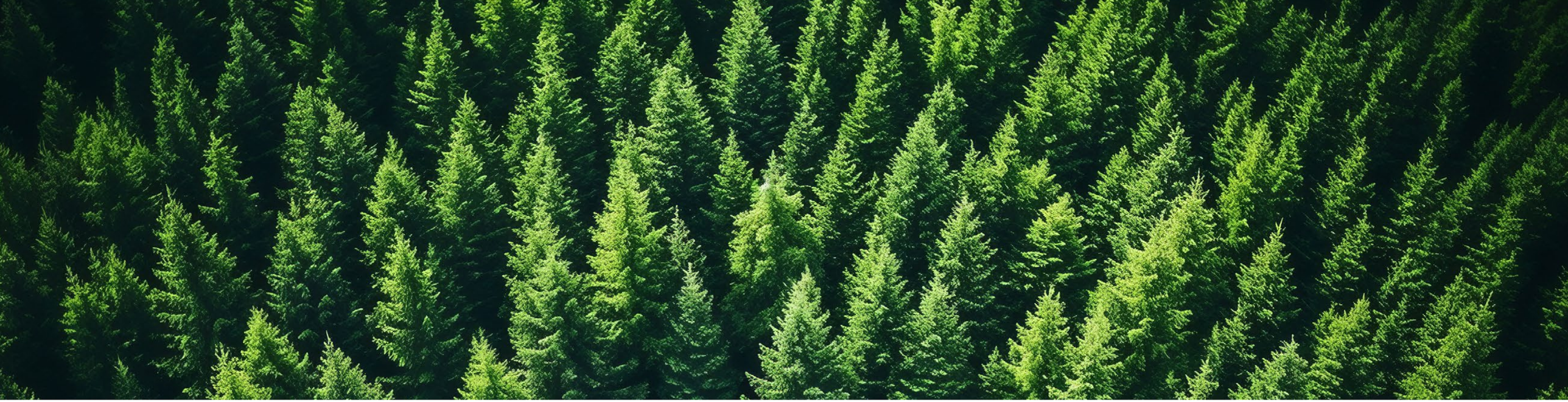
Stantec unites more than 31,000 employees working in over 450 locations across 6 continents who bring decades of experience in project design and implementation for nature-based solutions. Our large, multidisciplinary team of 5,000+ environmental staff has expertise in project execution across the globe, from coastlines to rivers, lakes, and wetlands, prairies to upland forests, and boreal ecosystems to arctic environments. Stantec's approach to project design integrates NbCS, geomatics analyses, natural capital, climate risk, GHG accounting, ESG advisory, biodiversity assessments, engineering, and ecosystem restoration to benefit both stakeholders and local communities. Step 4 "design" and Step 5 "build" leverage this expertise to successfully implement projects for crediting.

Deer Grove East project supported by Stantec to restore a historic forest preserve in Cook County, Illinois

Stantec teams supported the Prime Hook National Wildlife Refuge in Milton, Delaware involving 30 miles of shoreline reconstruction and 10,000 acres of wetland restoration

Registry Processes

Stantec's expertise spans a variety of carbon crediting registries and their associated methodologies for NbCS projects. These include, but are not limited to, Verra, the American Carbon Registry, Climate Action Reserve, and Gold Standard. We help clients meet listing requirements (e.g., disclosure documents and descriptions), perform risk and additionality assessments, and conduct rigorous GHG accounting (including uncertainty and leakage) necessary for project registration (Step 6), monitoring (Step 7) and credit issuance (Step 8).



NbCS Co-Benefits

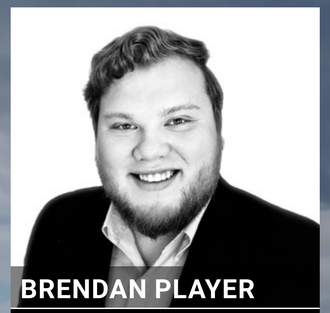
Co-benefits are the benefits of conducting a project that are not explicitly tied to landscape emissions and removals. NbCS can yield co-benefits through the other ecosystem services they enhance. This uplift can include improvements to biodiversity, human health, air quality, water quality, and many more products of ecosystem function. Co-benefits can be quantified and used by companies to show fulfillment of Environmental, Social, and Governance (ESG) goals or the United Nations Sustainable Development Goals (UN SDGs). A few programs have emerged to certify co-benefit generation through NbCS and in some cases this certification can be applied across all carbon credits associated with the project, enhancing their quality and value. Example programs include Verra's Climate, Community, and Biodiversity (CCB) standard and Sustainable Development Verified Impact Standard (SD VISta).

The CCB standard was created to support land use projects in addressing climate change, benefiting local communities and smallholders, and conserving biodiversity. Certification under this standard represents assurance that a given project is delivering tangible climate, community, and biodiversity benefits. SD VISta is a program for verifying the UN SDG impacts created by project activities. It serves to quantify and verify the benefits of projects through a rigorous set of rules, requirements, and independent assessment.

As part of the NbCS service offering, our interdisciplinary teams are tailored for individual project needs.

Meet the NbCS Team

JOSH RUNNING
NbCS Business Development Lead



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NbCS Team Lead

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NbCS Blue Carbon Lead

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Carbon and Sustainability Analyst

NICK POMPLUN
Carbon and Sustainability Analyst

CHRISTIANA JANSEN
Carbon Analyst

EMILY PAWLOSKI
Carbon Analyst

MARINA LOIACONO
Carbon Analyst

ELISE LJIKO
GIS Lead

MEGAN LAMONT
GIS Analyst

KATIE MCGEE
Biologist

AARON FEGGESTAD
Ecologist

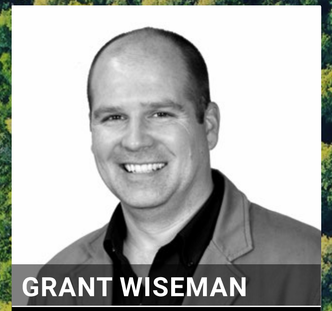
DOM KEMPSON
Global Nature-based Solutions (NbS) Lead

SCOTT PEYTON
Water Resources Sector Lead

CHUCK ROADLEY
Business Center Practice Lead

Additional Teams

Stantec contains a wide array of engineers, designers, scientists, and other professionals supporting a variety of projects and clients. The NbCS team frequently collaborates with a variety of climate, ESG, and remote sensing experts delivering innovative and holistic solutions.



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Remote Sensing Specialist and Data Scientist

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Vice President, Climate Solutions Leader – Canada

MICHAEL MONDSHINE
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Senior Principal, Regional Business Leader – US Mountain

BROOKLYN SAYLOR
Air Quality and Climate Change Consultant

BEN SMITH
ESG Consultant

DANIEL HEGG
Associate, Atmospheric Environmental Manager

MARCA HAGENSTAD
Senior Principal

NORMAN SHIPPEE
Climate Scientist

NATALIE MUIR
Regional Director, Environmental and Geosciences – Australia

ANDREW JOHNS
Technical Director: Nature based Solutions

Innovation

Stantec developed tools to streamline GHG accounting, feasibility assessments, and monitoring, reporting, and verification (MRV) process. These tools include:

- **Carbon Offset Tool** – An excel-based program used to facilitate credit yield estimates for NbCS projects across various habitats and project activity types.
- **Stantec's NbCS database** – A database housing thousands of primary literature-sourced emission factors, and carbon stock and sequestration estimates for various habitat types and locations.
- **CarbonWATCH** – A project monitoring tool that uses hyperspectral and LiDAR imaging to inventory carbon stocks in vegetation and soils throughout a project's lifespan. CarbonWATCH is especially useful for large and/or remote projects, where consistent and costly field-sampling campaigns are unfeasible to estimate dynamic carbon stocks safely and at scale.

SPATIAL DATABASE

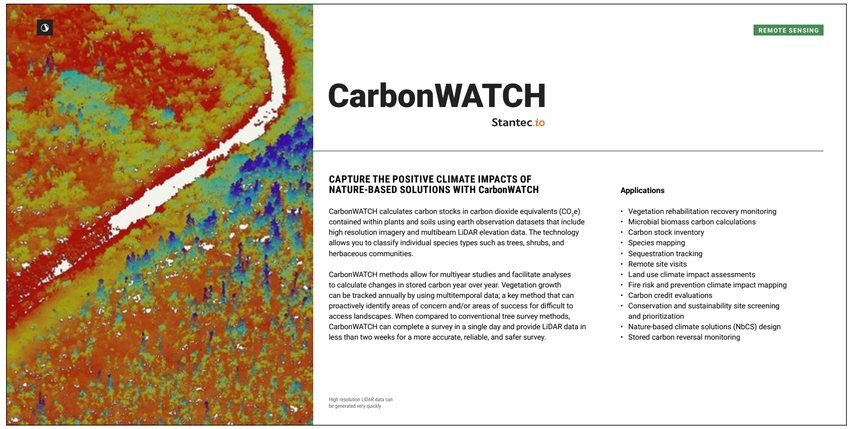
Stantec has developed tools for streamlining the NbCS carbon crediting process. This includes the ever-growing spatial primary literature database, currently housing thousands of allometric equations, emissions, factors, and other values of interest. This database can be searched based on project location helping to streamline sequestration estimates for various habitat types and locations.

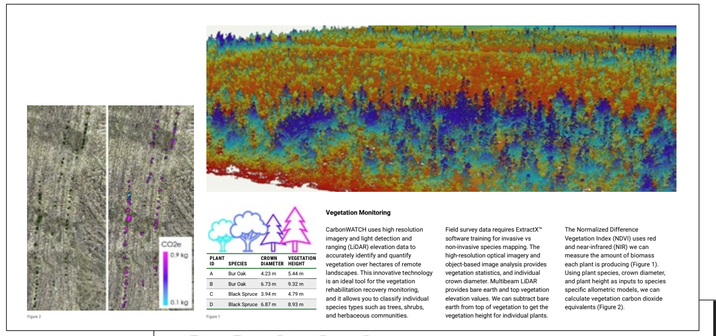
Stantec continues to expand our library of relevant data with every project.

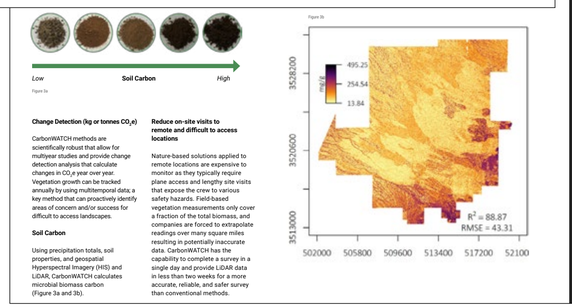
CarbonWATCH TOOL

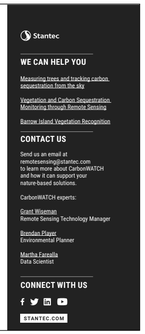
In collaboration with remote sensing experts, we have developed CarbonWATCH, a project monitoring approach using hyperspectral and LiDAR imaging to inventory carbon stocks in vegetation and soils throughout a project's lifespan.

CarbonWATCH is especially useful for large and/or remote projects, where consistent and costly field-sampling campaigns are unfeasible to estimate dynamic carbon stocks at scale. This approach streamlines the monitoring, reporting, and verification (MRV) process.









Project Example

Morobe, Papua New Guinea

This project opportunity example provides a snapshot of how Stantec's NbCS Team conducts step 1 of the assessment process. This involves an initial desktop analysis where planning level information is gathered using research and geospatial data. This assessment identifies the current land uses, ecoregions, habitats, conservation areas, and existing registered projects within a region of study to delineate potential areas of interest and NbCS project activities.

CLICK HERE **to see a more detailed map**

Resources

CarbonWATCH

CarbonWATCH–Assessing your carbon inventory at the landscape level using geospatial technology - Society for Ecological Restoration

Carbon capture methods: How can we capture and remove carbon from our atmosphere?

Cleaning Up the Mess: Quantifying Carbon Offsets with NbCS

The Sky's the Limit: Measuring trees and tracking carbon sequestration - The Environment Journal

5 reasons why your company should address greenhouse gas emissions

Measuring trees and tracking carbon sequestration from the sky

Capturing carbon: How nature-based solutions help achieve net zero goals

Climate Solutions Three-Part Series:

1.) Climate Solutions Webinar Series: Why now, and why us?

2.) Climate Solutions Webinar Series: Navigating climate

3.) Climate Solutions Webinar Series: Climate solutions that work

ADDITONAL STANTEC RESOURCES

Nature-based Solutions

Climate Solutions

Ecosystem Restoration

Natural Capital

Native Plant Nursery

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Learn more →

IPCC, 2019: Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems [P.R. Shukla, J. Skea, E. Calvo Buendia, V. Masson-Delmotte, H.-O. Pörtner, D. C. Roberts, P. Zhai, R. Slade, S. Connors, R. van Diemen, M. Ferrat, E. Haughey, S. Luz, S. Neogi, M. Pathak, J. Petzold, J. Portugal Pereira, P. Vyas, E. Huntley, K. Kissick, M. Belkacemi, J. Malley, (eds.)]. In press.

Stantec

Communities are fundamental. Whether around the corner or across the globe, they provide a foundation, a sense of place and of belonging. That's why at Stantec, we always design with community in mind.

We care about the communities we serve—because they're our communities too. This allows us to assess what's needed and connect our expertise, to appreciate nuances and envision what's never been considered, to bring together diverse perspectives so we can collaborate toward a shared success.

We're designers, engineers, scientists, and project managers, innovating together at the intersection of community, creativity, and client relationships. Balancing these priorities results in projects that advance the quality of life in communities across the globe.

Stantec trades on the TSX and the NYSE under the symbol STN. Visit us at stantec.com or find us on social media.

With every community we redefine what's possible