Nature-Based Climate Solutions: Using Crediting Tools and Remote Sensing to Streamline Project Evaluation

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Background/Objectives. The demand for carbon offsets to meet organizations' carbon neutral and net zero goals is increasing. This growing demand, coupled with pressures on organizations to show fulfillment of other environmental commitments and reduce the appearance of greenwashing, is driving organizations towards Nature-based Climate Solutions (NbCS). The projects involve sustainably managing, restoring, and/or conserving natural and semi-natural systems to enhance greenhouse gas removals from the atmosphere, a process known as carbon sequestration. Quantifying carbon sequestration, as well as other project co-benefits, is the first critical step in understanding the feasibility of NbCS. Evaluating a site's carbon sequestration potential to a high level of accuracy without substantial upfront investment can be difficult. Registry methods for quantifying credit associated with NbCS are complex, and protocols for assessing carbon stocks are focused on onsite measurements that often yield high levels of uncertainty when extrapolated to large areas. There is a need for tools and methods to streamline the crediting process and enhance the accuracy of calculations at scale.

Approach/Activities. Stantec's NbCS and remote sensing teams have developed crediting and quantification tools focused on streamlining the process of generating credit without compromising resolution. Stantec's Carbon Crediting tool follows registry-approved protocols for various NbCS types, guiding users through calculations from initial project identification and estimation of potential to monitoring for credit issuance. The CarbonWATCH tool combines high resolution imagery, multibeam LiDAR elevation data, empirically derived relationships, and existing soil and climatic datasets, so that users can conduct carbon inventories, and sequestration tracked with limited field data collection. These tools are enhanced by a spatial database of emission factors and species-specific allometric equations derived from primary literature to aid in the calculation and improve accuracy. The complex quantification and crediting process for large projects is made navigable by these applications, helping to generate the revenue required to make these projects economically viable.

Results/Lessons Learned. The resulting Carbon Crediting and CarbonWATCH tools facilitate inventorying carbon stocks and quantifying carbon sequestration in a way that is defensible and follows registry-approved guidance for credit certification. These tools must be continuously refined to ensure compliance with changing guidance and new data. Coupling these applications with scientifically rigorous and ecologically appropriate design techniques is critical to generate NbCS that are resilient and high functioning. Additionally, natural capital evaluations should be conducted to show contributions to other environmental, social, and governance (ESG) goals, such as supporting the recovery of biodiversity, improving air and water quality, and fostering community engagement.