



ESMC

Ecosystem Services
Market Consortium

Evaluation of Ospats+ Stratification Methodology: Summary

Ecosystem Services Market Consortium;
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Ecosystem Services Market Consortium (ESMC)/Ecosystem Services Market Research Consortium (ESMRC) is a non-profit public-private partnership that is transforming decarbonization along the agricultural supply chain through collective action. Our 60+ member organizations spanning the agricultural supply and value chains have collaboratively invested, tested, and launched Eco-Harvest, a harmonized, standardized ecosystem services market for agricultural supply chains. This voluntary market program is an accredited end-to-end digitized solution to decarbonize agriculture and to meet additional natural resource needs of corporates who are making significant investments and operational changes to achieve standards-based, reportable outcomes documenting their progress annually. Eco-Harvest incentivizes, quantifies, and verifies (through independent third-party experts) carbon, greenhouse gas (GHG) and water outcomes annually, paying farmers from the sale of Scope 3 outcomes to corporates.

Streamlining quantification and verification of soil carbon sequestration and ecosystem services at scale requires technical solutions that address both soil sampling and sampling design costs. Soil stratification, the process of incorporating additional data to minimize the sampling variance can be used to design sampling plans at lower costs without reducing uncertainty.

This report, [Evaluation of Ospats+ Stratification Methodology](#), reviews several stratification methods for soil sampling, including conditioned Latin hypercube sampling (cLHS), k-means clustering, and Ospats+. Ospats+, developed for use in Australian carbon markets, is useful as it determines both where to sample, and optimum sampling density for a given site. Ospats+, however, poses significant technical and computational challenges for large-scale application, suggesting its use be deferred until these challenges are addressed, especially in the context of the U.S. carbon market. After robust assessment and discussion in ESMRC technical working groups, the current ESMC stratification approach uses both cLHS and k-means clustering.

This report was commissioned by ESMC/ESMRC and authored by Dr. Dan TerAvest (Our Sci LLC), Dr. Dan Kane, and Joel McClure (Our Sci LLC) under contract to ESMC, December 2022.