The Case for a Biospheric Carbon Network (BCN)

Executive Summary

Increasing atmospheric carbon dioxide levels are causing climate change and altering global biogeochemistry ("metabolism of the Earth"), all of which threaten the sustainability of human economic and agricultural activities. A number of mitigation measures have been proposed, including a variety of voluntary and regulated carbon markets that would encourage reductions in anthropogenic carbon emissions and spur carbon sequestration efforts. Given the large exchanges of carbon between the biosphere and the atmosphere, opportunities exist for enhanced biospheric carbon sequestration (biosequestration). Biospheric sequestration provides an attractive way to begin to reduce net carbon emissions while other, long-term policy and technical solutions are still being developed.

In the absence of strong national and international solutions, regional policies have now emerged to encourage biosequestration, and Alberta and California have followed different policy paths. Opportunities for enhanced biosequestration abound in both regions, yet existing carbon sequestration programs and carbon markets do not take full advantage of the wide range of monitoring and validation tools now available, from field monitoring technologies to satellite observations. Consequently, carbon markets are not as effective as they might be. Primary challenges include the lack of a suitable cyberinfrastructure or operational methodology for integrating different metrics of carbon fluxes and stocks into a comprehensive metric of biospheric carbon uptake.

In this document, we propose an approach for integrating disparate measurements of biospheric fluxes and stocks as a foundation for unified measurement of carbon sequestration. A key recommendation is the development of a "Biospheric Carbon Network" to provide a transparent, validated metric of carbon biosequestration. This would provide an essential tool for demonstrating actual carbon sequestration, certifying emerging carbon markets, and encouraging a range of industries and activities that enable carbon monitoring.