

## Progress Report to the Climate Action Team

### Overview of Progress to Date – Agricultural Sector Carbon Market Workgroup

To date, the Agricultural Sector Carbon Market Workgroup (ASCMW) has had three full-day meetings, with numerous sub-committee working groups meeting between full Workgroup meetings. Two additional meetings are planned in September and October. The ASCMW has maintained a focused, cooperative approach to analyzing the potential for carbon offset or other credit development, and in preparing the final accompanying recommendations for each of the topic areas.

The ASCMW fully expects to have all recommendations finalized by its final meeting scheduled for October 22nd. Two of the four topic area recommendations will undergo a consensus vote at the September meeting, with the other two areas scheduled for vote at the October meeting. The Workgroup has already drafted and voted on (resulting in consensus agreement) an accompanying Assumptions and General Policy document. Additionally, because the ASCMW believes it critical to the establishment of agricultural offsets, a majority opinion position paper is being developed regarding the WCI proposal limiting offsets to 10% of emission reductions.

Included with this update are the Final Assumptions and General Policy Document; a draft introduction to the final recommendation package titled the “Ag Story”; and draft recommendations on Conservation of Ag Land and Precisions Ag/ Nutrient Management. Discussions will occur in all four of the topic areas around establishing additionality, an issue for which the Workgroup has not yet reached agreement.

### Recommendation Highlights

#### Agricultural Set Aside Lands

The ASCMW will recommend that offsets or other credits be considered for agricultural lands moved into conservation contracts, or other legal agreements after July 1, 2008 as long as carbon sequestration is identified as a benefit within those contracts and/or agreements. This will include current lands for which a contract and/or agreement is renewed or renegotiated such that carbon sequestration is identified as a benefit. The ASCMW will provide basic framework for development of baselines related to set aside lands, and options to address concerns related to monitoring, measurement, and verification.

Grazing lands and implementation of improved grazing techniques are addressed in the recommendation document as a potentially significant source of carbon offset development. Currently, there is much in the way of university and governmental studies that show great promise in this area; however, the ASCMW believes that enough questions remain surrounding this potential that recommending the development of offsets is premature. Based on this, the ASCMW will recommend that further study in this area be conducted, preferably within Washington State. Depending upon the results of those studies, future development of offsets may be considered.

### Precision Farming

The ASCMW will recommend that offsets or other credits be considered for land owners electing to implement precision farming techniques. These offsets or other credits will be based on validated reductions in nitrogen fertilizer and fuel use for those lands. In regards to fuel use, the Workgroup recommends focus only on use related to “diesel” that is specifically for use in agricultural operations. Without this limitation, the ASCMW believes that too much conflict may arise between the agricultural sector and the transportation sector. The ASCMW is proposing methodology to establish baselines and monitoring, measurement, and verification techniques.

### Anaerobic Digesters/Other Waste Energy Utilization

The ASCMW believes there is significant potential for the development of carbon offsets and greenhouse gas (GHG) emission reductions as a result of the application of Anaerobic Digestion. In light of this, an ASCMW subcommittee is working to complete a draft recommendation document that presents the case for the development of offsets related to the development and operation of anaerobic digesters. The document will be presented to the full ASCMW at the September 22<sup>nd</sup> meeting. Regulatory difficulties related to the incorporation of organic fraction municipal solid waste (OFMSW), will be identified along with suggestion(s) on how to resolve those issues in order to improve upon efficiency in both GHG reduction and power generation.

### Agricultural Carbon Management

The ASCMW believes there is significant potential for the development of carbon offsets for the use of agricultural practices and technologies that increase sequestration of atmospheric carbon in soils and vegetation. An ASCMW subcommittee is working to complete a draft recommendation document that presents the case for development of offsets related to sequestration of carbon in soils and vegetation. The document will be presented to the full ASCMW at the September 22<sup>nd</sup> meeting. The document will provide criteria by which the determination of baselines and additionality should be made for offset projects.

### Position Paper WCI 10% Offset Limitation

The ASCMW is developing a position paper that will provide a recommendation regarding the 10% limitation on offsets. The draft document attempts to balance both philosophical and scientific realities related to this issue. We are taking care to present all positions in developing the final recommendation, which will be presented as a majority opinion, with minority opinions noted. This topic is scheduled for discussion at the September 22<sup>nd</sup> meeting.

## Setting the Stage – Agricultural Sector Carbon Market Workgroup

The agricultural sector in Washington State is identified, along with the forestry sector, as having the potential to provide carbon offsets or other credits within a state or regional cap and trade system. Offsets or other credits may be long or short term in duration depending on their acceptability within a regional carbon market. Given the proposed reductions for greenhouse emissions cited in the Washington goals and/or those proposed by the Western Climate Initiative, the opportunity exists for a portion of that demand to be met with high quality carbon offsets or other credits generated through agriculturally focused projects.

In acknowledgement of this fact, the Washington State Legislature directed an analysis of the potential for these credits to be developed within a voluntary program that considers potential economic advantages/disadvantages to Washington agricultural producers that may arise from the state's participation in a regional cap and trade system. These offsets or credits may be used to assist entities faced with a regulatory cap on their emissions to achieve emission goals.

Methods used to generate offsets or other credits within the agricultural sector generally have co-benefits to the environment. Studies conducted by the federal government and universities focused on modifications to agricultural practices such as no-till, direct seeding, precision farming, and conservation set-a-sides have been shown to result in an increase of stored carbon stocks in both soil and biomass. New technologies related to anaerobic digestion or animal manure alone or coupled with other waste streams have demonstrated the ability to reduce greenhouse gases such as methane, not only by emission reduction, but through the generation of electrical power and organic fertilizers.

Several areas within the agricultural sector exist for carbon offset exploration while providing environmental co-benefits. Those areas that diverge from the business as usual paradigm and hold the most promise from an implementation and verification standpoint have been the subject of review by the Agricultural Sector Carbon Workgroup (ASCMW). Based on these considerations the ASCMW has elected to focus efforts on four of the six areas identified in 2007 by the Climate Advisory Group. They are:

- Agricultural Lands Set Aside or Managed for Conservation
- Management of Agricultural Lands Using Precision Management Techniques
- Management of Agricultural Lands to Promote Carbon Sequestration
- Development of Digester Systems to Manage Livestock and Agricultural Bi-Products

In evaluating each of these areas the ASCMW has attempted to address as many existing concerns regarding offsets developed within a biological system as possible. As is the case with most biological systems, it is not always easy to directly measure input and outputs. In consideration of this fact, potential actions that may result in the generation of a carbon offset or credit must consider the ability for direct quantification or when it is necessary to rely on the application of models or other indirect methods that remove a sufficient amount of the uncertainty such that confidence is achieved with acceptable statistical limits.

The ASCMW has provided a series of recommendations regarding not only the potential for offset development within the agricultural sector (subject to the conditions of the Washington State Legislature), but also the outline for “protocols”, by which development of carbon offsets or other credits within the agricultural sector may begin. Included in the products delivered by the ASCMW are recommendations for policy development or modifications that may be necessary to facilitate offset development while achieving a higher level of environmental protection and increasing the profitability of the agricultural sector with the intent to continue to build and develop practices that result in a decline of greenhouse gases in all sectors within Washington State.

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## Assumptions for Development of Recommendations And Complementary Policy Statement

The following assumptions made by the Agricultural Sector Carbon Market Workgroup will guide the development of all recommendations originating from the group and delivered to the Washington State Department of Ecology and Department of Community, Trade, and Economic Development. These assumptions are deemed critical by the Workgroup in order to proceed with recommendations that are in conformance with EESB 2815, which requires that:

Recommendations developed for voluntarily participation of agricultural lands and practices in an offset or other credit program in the regional multi-sector market-based system must ensure that the baseline does not disadvantage this state in relation to another state or states, and that the recommendations shall address agricultural products, including accounting for fossil intensive substitutes; agricultural land and practices; and agricultural lands set aside or managed for conservation as of, or after, the effective date of EESB2815.

### Assumption One

In order to implement the recommendations specified in Section 4(g) of EESB2815, the Workgroup will consider the development of offsets or other credit programs for the following agricultural activities:

- Agricultural Lands Set Aside or Managed for Conservation
- Management of Agricultural Nutrients Using Precision Management Techniques
- Management of Agricultural Lands to Promote Carbon Sequestration
- Development of Digester Systems to Manage Livestock and Agricultural & Food Processing By-Products

### Assumption Two

The carbon market generated as a result of a regional multi-sector market based system will allow offset projects focused on technologies or practices that target reductions in N<sub>2</sub>O, CH<sub>4</sub>, CO<sub>2</sub> or other GHG emissions or increasing storage of carbon in soils, though all will be presented on a CO<sub>2</sub> equivalent basis. Offset projects that impact the emissions of more than one gas will need to account for consequent changes in the emission of each gas.

### Assumption Three

Each potential offset derived from the agricultural activities specified under EESB2815 must accept some level of uncertainty. The Workgroup acknowledges the critical nature for verification and measurability in striving to reduce uncertainty; however believes that in order to promote offsets for the health of a cap and trade system initial projects must include a tolerance for uncertainty that will be reduced over time.

### Assumption Four

Potential offsets generated as a result of an agricultural sector project must have reasonable requirements for measurement and verification. This shall include reasonable establishment of a

baseline or baselines initially using a hybrid assessment approach and moving toward project-specific assessments. Such approaches will likely include the use of soil/crop process models. These baselines must not provide for a disadvantage to the State of Washington.

### **Complementary Policy Statement**

A primary issue related to the development of offsets within major areas of the agricultural sector is its nonpoint source characteristic and the potential vast amounts of data currently required for validity and measurability. The amount of carbon sequestered in a field or region requires field measurement and monitoring which potentially may exceed the financial benefits of an offset to a land owner, and protocols for doing so generally have not been validated. However, verification and measurability are necessary for any policies based on environmental performance.

In order to address the problematic nature of nonpoint offsets, there will be a need to utilize modeling approaches that can be applied in varied environmental and management conditions. Initially, depending on the extent to which the market will require validation and measurability, this model or models will need calibration which will entail the collection and application of site specific data over time until sufficient information exists that will allow application over numerous and varied climatic and soil conditions.

In order to advance the availability of offsets within a cap and trade system, a complementary policy must be developed that addresses the short term need for offsets with a reasonable approach to achieving validation and measurability for projects. In view of this position the Agricultural Sector Carbon Market Workgroup recommends the following:

- 1) Initial projects may require use of regional default-based quantifications and a standardized approach to establish baselines and monitor progress. Projects utilizing default-based quantifications shall be governed by a limited time term and/or a discount factor applied to any generated credits. During the term of the initial contract, emphasis should be placed on development of project specific data.**
- 2) Offset credits originating with projects utilizing specific assessment methodologies to establish baselines and document progress shall be offered at full credit using standard contract timeframes.**
- 3) A carbon offset market for the agricultural sector in Washington State gradually move toward a hybrid approach for the establishment of baselines and measuring progress as confidence is built in modeling capabilities and statewide data is collected through the development of projects using project specific assessments.**

This approach would make use of current information related to standardized assessments as an initial starting point for creation of offsets. During implementation of the initial offset market, public policy would drive project specific assessments for subsequent projects. As a result of the later action, data regarding the effects of Washington's varied climatic and soil regimes would be collected, which in addition to addressing validation and measurability issues, can be used for the refinement of a model or models that would allow ultimately the implementation of hybrid assessments as a preferred methodology for the creation and monitoring of agricultural offset projects.

## Development of Potential Offsets Related to Implementation of Precision Farming Techniques

### Introduction

This paper explores the potential to develop meaningful carbon offsets through the implementation of precision farming techniques. Precision farming is defined as an integrated information- and production-based farming system that is designed to increase long term, site-specific and whole farm production efficiency, productivity and profitability while minimizing unintended impacts on wildlife and the environment.

Current application of precision farming techniques coupled with numerous national and international studies have documented reductions in the application of synthetic (nitrogen based) fertilizers and pesticides while realizing large reductions in fuel usage over traditional farming methods. These results can lead to significant reductions in the emission of greenhouse gases. Based on results from current implementation of precision farming techniques in Washington State and data gathered through university studies, the Agricultural Sector Carbon Market Workgroup (ASCMW) believes there is significant potential for the development of carbon offsets and greenhouse gas emission reductions as a result of the application of precision farming techniques.

### Basis for Selection

Precision farming methodologies increase yields, protect the environment, and minimize the costs associated with the application of fertilizers, pesticides, and water. These activities have been shown to have impacts associated with the reduction of emission of greenhouse gases (mainly N<sub>2</sub>O). N<sub>2</sub>O entering the atmosphere as a result of the volatilization of unabsorbed nitrogen fertilizer accounts for one-third of the worldwide greenhouse gases produced by agriculture <sup>(1)</sup>. According the USDA reducing overlap in fertilizer and pesticide applications on the 250 million acres of cropland used to produce major crops, petroleum-based fertilizer and pesticide costs could be reduced up to \$1 billion annually. A 1,000-acre farm can save up to \$13 per acre by using precision agriculture techniques <sup>(2)</sup> <sup>(7)</sup>.

Use of precision farming methods also results in decreased use of fuel by avoiding unnecessary passes of farm machinery over fields or orchards. Practitioners of precision farming methods have reported significant reductions in fuel usage resulting in reduced emissions from the burning of fossil fuels <sup>(3)</sup>.

### Synthetic Fertilizer Application

In evaluating the offset potential for reduced application of synthetic (nitrogen based) fertilizers the ASCMW has confined itself to those activities resulting from application only. The manufacturing aspect and the potential offsets realized through reduced production are left to the industrial/manufacturing sector for consideration.

Numerous studies conducted by regional universities indicate that reductions of nitrogen fertilizer of up to 40% can be realized through the adoption of precision farming techniques <sup>(4)</sup>. Based on 2007 estimates of synthetic fertilizer used in Washington State <sup>(5)</sup> this can amount to 79,758,088 Kg N or .2273

MMTCO<sub>2</sub>e direct emissions and .0253 MMTCO<sub>2</sub>e indirect emissions. While it may not be prudent to assume a 40% reduction across the state it is reasonable to assume that a significant reduction (15 – 25%) is realistic.

The methodology employed to derive both direct and indirect emissions is uniformly used across the United States to account for the contribution of synthetic fertilizers to total emissions from the agricultural sector. It provides for a simple and accepted method to determine changes in N<sub>2</sub>O emissions related to changes in total fertilizer application. As a result, the offset value for a proposed project can be readily determined using application records provided an acceptable baseline is established.

Since N<sub>2</sub>O emissions from synthetic fertilizer applications are conducted based on a growing year, the ASCMW believes that initial offsets developed as a result of precision farming techniques utilize records of application at the beginning of the 2008 growing year as a baseline (suggest *tons applied/acre*). This will allow for implementation of projects while addressing the July 1, 2008 date specified under Section 4(g) of EESB 2815. Progress is measured on an annual basis by comparing current year records (*tons applied/acre*) with the baseline. Minimum levels of performance will be dictated by project level or aggregate contracts.

### Fuel Use

In evaluating the offset potential for reduced fuel use resulting from precision farming, the ASCMW has confined itself to considering only use of “red diesel”. Red diesel is used only for the operation of on-farm machinery and is not subject to federal or state taxes. This provides for a clean distinction between fuel usages attributable to agriculture from that attributed to the transportation sector.

Implementation of precision farming techniques have been shown to result in significant reductions in diesel usage as a result of reducing or eliminating overlap in the application of fertilizers and pesticides. Additional savings are realized in the reduction of over irrigation and costs associated with pumping water using on-farm energy generation (it should be noted that Power generation originating from off-farm systems cannot be considered for offsets, due to “double counting” within the energy sector). National and international studies of the effects of precision farming indicate anywhere from a 30 – 50% reduction in fuel use over that realized using conventional farming methods.

As an estimate of potential carbon offset due to the reduction of diesel use consider 1000 gallons burned in the course of conventional farming results in the emission of 2760 Kg of carbon <sup>(6)</sup>. Reducing the fuel use by 30% as a result of implementing precision farming techniques cuts the carbon emission by 825 Kg or 2973 Kg CO<sub>2</sub>e. This reduction would be considered valid for the purposes of creating a carbon offset.

In order to establish a baseline for fuel use it is logical to employ the same timelines and conditions specified earlier for synthetic fertilizers. Offsets developed as a result of reduced “red diesel” use in conducting precision farming should be based on a growing year, the ASCMW believes that initial offsets developed as a result of precision farming techniques utilize records of application at the beginning of the 2008 growing year as a baseline (suggest *gallons/acre*). This will allow for

implementation of projects while addressing the July 1, 2008 date specified under Section 4(g) of EESB 2815. Progress is measured on an annual basis by comparing current year records (*gallons/acre*) with the baseline. Minimum levels of performance will be dictated by project level or aggregate contracts.

### Pesticide Application

Implementation of precision farming techniques results in pesticide reduction of up to 45% (NRCs). Given the source of many currently used pesticides is petroleum, there appears to be a significant potential for GHG reductions as a result in decreased use. However, currently it is difficult to quantify an overall reduction for pesticides for either manufacturing, or potential volatilization as a result of application.

Each specific pesticide will have its own emission value based on specific characteristics and method of application. While there appears to be a potential of offset development as a result of reduced use, the ASCMW feels that sufficient data does not exist to enable quantification of the emission expected as a result of pesticide application. However, because the potential does exist for future offset development, consideration should be given to further data collection in the hope of developing future offsets.

### **Case for Additionality**

The movement from traditional agricultural practices to precision farming practices entails significant investment on the part of the land owner willing to implement the necessary changes required to achieve reductions in CO<sub>2</sub>e as a result of reducing application of N<sub>2</sub>O emitting fertilizers and/or reducing the burning of fossil fuels. The generation of marketable offsets as a result of moving from traditional farming practices to precision practices, incentivizes this activity on a farm by farm basis (project specific assessment). This action is beyond what would be termed “business as usual” and therefore additional beyond the norm for the sector. To address the question regarding “business as usual” the ASCMW recommends that only those projects begun during the 2008 (date to be discussed) growing year forward be considered additional. Without the implementation of precision farming practices, there would not be reductions in key GHG’s easily measurable and verifiable on a project specific basis. As a result the ASCMW strongly believes that the additionality test is met through implementation of the recommendations stated below.

### **Recommendations**

#### General

- PF-1** *It is unlikely that any single operation will generate sufficient offsets to be marketable in a regional system; therefore the ASCMW strongly recommends that an aggregation system be put into place. This recommendation is made here but applies to all subsequent recommendations within this paper.*
- PF-2** *Offset credits are owned and marketed by either land owners or operators who are ultimately responsible for financial benefits and/or risks associated with that land.*

Synthetic Fertilizer Use

- PF-3** *Reduction in the use of nitrogen based fertilizers using the beginning of the 2008 growing season as a baseline are eligible for marketable carbon offsets in a regional cap and trade system.*
- PF-4** *Carbon offsets resulting from a reduction of nitrogen based fertilizer application shall account for both direct and indirect N<sub>2</sub>O emissions and should be calculated (using at a minimum) 2008 IPCC Guidelines for Greenhouse Gas Inventories.*

Pesticide Use

- PF-5** *At this time there the ASCMW finds insufficient data available to recommend offset development from reductions in pesticide use. Therefore, the ASCMW recommends further study of this potential activity for offset inclusion*

Fuel Use

- PF-6** *Reduction in the use of fuel for the purposes of developing marketable carbon offsets in a regional cap and trade system, shall only apply to “red diesel” used in the course of implementing precision farming activities using the beginning of the 2008 growing season as a baseline.*
- PF-7** *Conversion from gallons of “red diesel” used to CO<sub>2</sub>e shall be based on US EPA factors for most appropriate engine and operation conditions.*

**References**

- (1) Stern Review Report on the Economics of Climate Change, 2006
- (2) USDA-NRCS, *Conservation Resource Brief-Energy Management*, Number 0608, February 2006
- (3) Soil Conservation Council of Canada, *Global Warming and Agriculture – Fossil Fuel Use*, Volume 1, Number 3, January 2001
- (4) Kruger, Chad *Integrating Precision Conservation Technologies to Increase On-Farm Nitrogen Use Efficiency-Final Report*, WSU July 2008
- (5) Washington State Department of Agriculture, 2007 Fertilizer Sales Records
- (6) Lal, Rattan, *The Societal Value of Soil Carbon Sequestration*, Presentation Ohio State University, 2004
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## Development of Potential Offsets Related to Conservation and Grazing Lands

(Version 09/03/08)

### Introduction

This paper explores the potential to develop carbon offsets in conjunction with voluntary landowner conservation programs. Historically, landowner conservation programs administered through federal, state, or private agencies such as the Conservation Reserve Program (CRP) and the Conservation Reserve Enhancement Program (CREP) have compensated landowners for establishing forests or grasslands on marginally productive agricultural lands or environmentally sensitive areas. Establishing a carbon offset program within new or existing conservation lands is specifically noted as an area for consideration under Section 4(g) of EESB 2815. The implementation of effective land management practices, especially through public or private stewardship programs, can in addition to enhancing water quality, wildlife habit, and landscape aesthetics, result in increased carbon sequestration.

### Basis for Selection

#### Overall Considerations

In Washington, significant acreage is preserved and protected through enrollment in conservation contracts, leases, agreements or other similar mechanisms. In 2007, 1,539,250 acres of land were enrolled in CRP, 11,045 riparian acres were restored under the CREP, and considerable acreage was set aside for other public and private conservation programs and actions. Washington's Department of Natural Resources (DNR) leases approximately 1 million acres of grazing lands in Washington. Other publicly held and privately held grazing lands add several million additional acres<sup>(1)</sup>.

The carbon sequestration and greenhouse gas (GHG) emissions reduction potential for Washington state lands enrolled in conservation programs varies by climate and soil type. Published sequestration potential ranges from a high of 0.5 tons/acre to a low of 0.1 tons/acre<sup>(2)(3)</sup>. The Washington State Department of Agriculture (WSDA) estimates 0.32 MMT of carbon or 1.13 MMTCO<sub>2</sub>e is sequestered yearly as a result of CRP, EQUIP, and CREP lands. It is estimated that through the implementation of progressive grazing management practices .3 to .7 tons/ac/yr C can be sequestered in soils<sup>(4)</sup>. Using only grazing lands leased through the DNR 2.29 MMTCO<sub>2</sub>e potentially may be sequestered annually.

Although the agreements protecting these lands may be in perpetuity, the more common term for the agreements is for a limited period of years. For example, CREP leases cannot extend beyond 15 years and CRP land contracts are generally for a 10 year period. Given these facts and in considering conservation lands for offset potential, it may be necessary to consider a limitation to their life span.

We are entering a period when many of the terms of current agreements will be expiring, and the landowner can return to managing these lands for production. Because of changes in regional and global economics related to food production and governmental policies, a considerable portion of the land currently in conservation programs may return to agricultural production in the near future. As a result, there is a strong potential for carbon historically stored in these lands to be released. This release

represents not only a reduction in the potential amount of carbon stored but also in a new source of greenhouse gas (GHG) emissions.

### Establishment of Baselines

In considering conservation lands and managed grazing lands as sources for potential carbon offsets, significant questions arise regarding baseline establishment, verification, measurement, and monitoring. The establishment of a baseline on which to develop carbon offsets for nonpoint related activities within the agricultural sector has remained problematic. Generally, two types of mechanisms are considered when establishing these baselines; those which involve use of regional data synthesized to arrive at an “average value” for soil carbon, or those based on site specific data collected especially for the purpose of establishing baselines for a project or like data collected for other purposes or as part of a survey.

The ACSMW considers baselines established which limit the level of uncertainty to be preferable to those based on regional averages. Baselines which utilize as detailed (and preferably quality assured) data as possible should be considered over those which are based on regional averages. Currently, there are two options available.

- 1) The use of NRCS SURRGO soil surveys can provide a data source on which to establish initial baselines for offsets derived from conservation lands. The range for soil organic matter (SOM) contained in these data sets may serve as a baseline subject to the completion date of that specific survey. There is a degree of uncertainty associated with use of this data given the fact that pertinent information is presented as a range, and depending on the completion data of the survey, that SOM maybe substantially outdated.
- 2) Initial baselines established using soil carbon data collected through comparative assessment of cropped acreage and conservation lands in near proximity to each other should be considered. This method provides a reliable data set and will ultimately provide the smallest degree of uncertainty.

### Verification, Measurement, and Monitoring

Verification, measurement, and monitoring (VMM) of actual gains in soil and biomass carbon within conservation and managed grazing lands remains a subject of discussion among developers of cap and trade systems. Generally, the mechanisms used to address these subject areas through current voluntary programs are not sufficient for regulatory based systems which require reduced uncertainty for marketable offsets. However, more rigorous methods for reliability verifying, measuring and monitoring potential offsets derived from conservation lands do exist and have been implemented<sup>(6)</sup>. In order to address uncertainty surrounding VMM approaches that focus on project specific assessments either single site or paired plot sampling are recommended. In the course of designing a VMM protocol consideration should be given to the establishment of a statistical level of confidence. Previous studies examining the application of the paired plot approach have achieved greater than a 95% confidence under controlled circumstances<sup>(5)</sup>.

## Case for Additionality

The determination of additionality or actions that go beyond “business as usual” is a cornerstone element to the quantification of carbon offsets potentially generated as a result of agricultural projects. The determination of additionality is an approximate process which lends itself to consideration of projects for which there are co-benefits such as those considered in this paper. It is generally recognized that many agricultural activities including establishment of conservation lands and enhanced grazing methodologies do result in increased carbon sequestration both in above and below ground biomass/soil carbon. Whether, the co-benefit aspects of conservation and grazing lands related to carbon sequestration are to be considered eligible for offset development will depend on public policy decisions within a regional cap and trade system. There is strong sentiment among members of the Agricultural Carbon Sector Market Workgroup that aspects exist of conservation and grazing lands that meet the additionality test.

The question of additionality as applied to conservation and grazing lands focuses on the establishment of those lands primarily to enhance water quality, wildlife habit, and landscape aesthetics with the co-benefit of carbon sequestration. Previous contracts for federal programs (CRP, CREP, EQUIP, etc.) and other actions taken under state or private agency oversight generally, did not consider the benefits of carbon sequestration when originally implemented even though sequestration is assumed to have occurred. Later federal contracts have begun to cite carbon sequestration as a benefit of the action(s). Consideration of the potential release of stored carbon if conservation lands reverted back to active agricultural lands and continued sequestration of carbon in existing conservation lands that continue beyond contracted timeframes are examples of additionality pertinent to potential offsets within the agricultural sector. Overall, consideration of additionality should focus on

## Recommendations

### General

There exists a potential for the development of marketable carbon offsets resulting from conservation lands. If the acreage currently in conservation lands were to return to active agricultural production, the rate of overall GHG emissions would likely increase within Washington State. There also exists a significant future potential for offsets to be generated from the implementation of progressive grazing practices; however, less data is available on which to develop acceptable baselines.

The co-benefits derived from conservation lands and potentially from grazing lands are significant in terms of environmental protection and habitat restoration. The fact that carbon sequestration also occurs as a result of this action should not preclude designation as additionality. In consideration of the factors presented above the ASCMW recommends the following:

**CGL-1 The development of a complementary policy that addresses the short term need for offsets with a reasonable approach to achieving measurement, monitoring, and verification activities for offset projects related to conservation and grazing lands.**

- CGL-2** Offsets should be developed for current conservation lands kept in conservation status that would otherwise revert to actively worked agricultural lands following termination of contract or agreement after July 1, 2008. Contracts must be revised to reflect carbon sequestration as a benefit.
- CGL-3** Offsets should be developed for the voluntary conversion of actively worked agricultural lands to conservation lands regardless of primary purpose as long as carbon sequestration is a recognized co-benefit.
- CGL-4** Current set aside lands that have more that 5 years left on the contract should be considered for offset development beginning as of July 1, 2008 provided that new commitments for carbon sequestration may be included as an amendment.

#### Baselines

- CGL-5** Baselines for offset projects related to conservation lands should use (in order of preference)
- 1) Data collected as a result of a pair-plot approach
  - 2) Data collected as a result of a NRCS SURRGO survey

#### Verification, Measurement, and Monitoring

- CGL-6** A minimum level of confidence associated with calibration and quantification methods should be established. The ASCMW recommends a 70% confidence interval or higher. Projects achieving less than 70% confidence may be offered at a discounted rate.
- CGL-7** Verification, measurement, and monitoring should be conducted by third parties and should include the paired-plot approach
- CGL-8** The gathering of data should not adversely impact the financial benefits to a land owner from carbon offset payments. This would create a financial disadvantage for potential participants.

#### References

- (1) NRCS, *Summary Report, 1997 National Resources Inventory, Revised December 2000-Table 2*
- (2) Chicago Climate Exchange, *Rangeland Soil Carbon Offsets*, August 20, 2007
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- (4) Mayeux, Herman J. et al, *Rangeland CO<sub>2</sub> Fluxes: Implications of the Results from the Flux Network*, Proceedings – American Meteorological Society, July 1,2002
- (5) Follett, Ron, *The Conservation Reserve Program and Carbon Sequestration*, USDA-Agricultural Research Service-May 2002

- (6) The Nature Conservancy, *Land Management and Conservation Activities as Potential Offset Projects under the Northeastern Regional Greenhouse Gas Initiative*, August 2004