Comments on CCAR Draft Forestry Protocol of December 2008

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I commend the Forest Project Protocol Working Group and facilitators for addressing many difficult issues, and improving on previous forest project protocols of CCAR and others.

These comments are divided into two different types of comments. First, four key issues are addressed. After these key issues, some smaller technical issues are addressed.

Key Issue: Permanence

100 years is not permanent (sections 3.3, 8.1, and 7). Voluntary greenhouse gas (GHG) emission offsets have been repeatedly criticized (sometimes justly, and sometimes unjustly) for not being real. We need to be truthful about what we are claiming. If offsets are being offered for a fixed time period, with no assurance that they will be maintained after that time period, the offsets should be represented as temporary. Being truthful would head off criticisms that CCAR offsets are not what they are claimed to be. Buyers may decide that 100 years is long enough and choose to purchase 100-year CCAR offsets, but CCAR needs to be clear about what it is claiming and endorsing.

A corollary point is that if the carbon sequestration underlying an offset is reversed and not replaced, the offset should be cancelled (Section 8.1).

In my opinion, there are ways to provide sufficient assurance that forest carbon sequestration is permanent, without requiring monitoring go on forever. However, this monitoring question is separate from the issue of counting impermanent offsets as permanent.

Key Issue: Avoided Deforestation Baselines

Although the proposed risk discounting (given in tables 6.2 and 6.3 in Section 6.3.1.2) is a creative and interesting proposal, I expect that the proposed method will not stop the problem of crediting avoided deforestation on land parcels that would not have been deforested during the crediting period. I suggest considering econometric analysis of the elasticity of supply of development (similar to leakage analysis of afforestation/reforestation projects), any applying this leakage rate to avoided deforestation projects.

A project could avoid leakage by doing development, but having lower emissions per dwelling unit (or other development "product") than average. If CCAR chooses to credit reducing emissions from on-site development, I suggest investigating the feasibility of

promulgating average emissions per unit or per square foot of building, similar to the calculation of "applicable mean" forest carbon stocks proposed by the draft forest project protocol.

Key Issue: Improved Forest Management Baselines
We have two conflicting issues here. One the one hand, for an offset to be real it must be additional to what would have happened in the absence of the offset project. Two, we wish to reward landowners who do ecologically desirable forest management and sequester carbon in their forests.

Because motivation is inherently impossible to determine with certainty, it is better to implement policies that do not require determining the motivation of landowners. Determining the additionality of forest management is particularly problematic—much more so than for afforestation/reforestation. For forest management, avoiding having to assign motivation means using a policy approach other than offsets. Each land parcel could be assigned a baseline carbon stock and if the actual carbon stock goes above the baseline, the landowner would receive tradable credits. However, to avoid the necessity of determining motivation, if the carbon stock goes below the baseline, the landowner should have to surrender allowances for the lost amount of carbon stock.

It is not within CCAR's power to establish forest carbon crediting system where all lands are required to participate. So the question becomes whether it is possible to develop an acceptable accounting system for forest management projects where landowners voluntarily choose whether or not to opt into the offset system. Because the loss of net present value of wood product revenues resulting from deferring timber harvest makes it very expensive (per ton CO2e of offset) to create GHG offsets by extending forest rotations and other improved forest management practices, one could argue that forest management projects (where harvest is legal and economically feasible) are not driven by GHG offset revenues, will mostly be non-additional. In the absence of a effective method for determining the additionality of forest management offsets, I recommend that CCAR defer granting of forest management offsets until a reliable system can be implemented.

If CCAR chooses to go ahead with granting offsets for forest management projects, the baselines should be different than what is specified in the draft protocol. The harm of issuing non-additional offsets should be lessened by at least requiring that these offsets represent actual tons of sequestration. Specifically, in Section 6.2.1.1 the "added constraints" on baselines should be that (a) if the starting carbon stock is above the "applicable mean" carbon stock, the crediting baseline should be the higher of the starting carbon stock on private lands and the legal minimum carbon stock under NPV maximizing management, and (b) if the starting carbon stock is below the "applicable mean" carbon stock, the crediting baseline should be the higher of the applicable mean and the legal minimum carbon stock under NPV maximizing management.

Also note that modeled predictions of management that maximizes net present value change as the absolute and relative prices of wood products change. Prices used for modeling should be the prices occurring in the year of the vintage of the offset (perhaps

some sort of average prices through the year, or the prices observed during the main harvest season, or prices at the middle of the calendar year).

Key Issue: Leakage

The econometric modeling of Murray and others cited by the draft protocol makes more sense than arbitrarily assigning a leakage rate. However, one also needs an emission rate for the leakage. Specifically, section 6.1.2 states that the leakage rate for afforestation of cropland shall be 24%. The question is then what emission occurs per acre of land converted to cropland. The only comprehensive land conversion information I have found for the US is old National Resources Inventory analysis that shows that much of the land converted to cropland comes from pasture or grassland, not forest. This data matches what we see when we travel around the country, or talk to farmers. The question then becomes one of estimating the loss of carbon occurring when grassland or pasture is converted to forest.

I recommend that CCAR calculate a default weighted average emission rate for US lands converted to forest, weighting the proportions of lands being converted to cropland from various land cover types, times the average expected carbon emissions for each type of conversion.

Other Technical Issues

Section 2.1.1 states that a project can qualify as a reforestation project if the project lands have lost 20% of their carbon stock. A moderate thinning should remove this much carbon and leave the stand poised to grow vigorously. I suggest that this percent loss provision be deleted.

Section 6.1.1 discusses modeling of newly reforested stands. Forest growth models are unreliable when applied to newly planted seedlings (or expected plantings). I think that local growth and yield tables based on stand site class would give more reliable results.

Section 6.4 states that the amount of wood products left after 100 years should be counted during offset calculations. This may be reasonable for forest management projects (as long as the sequestration is not double counted elsewhere, by the entity that owns the wood, or some other accounting such as counts of GHG sequestration based on landfilling wood products). However, for avoided deforestation projects a much earlier time point is needed to avoid over crediting the project.

Section 8.2 requires annual monitoring reports. Will a project's credits (or at least its credits held in its buffer account) be cancelled if the project fails to report?

In Appendix A, Step 1, the draft states that the methods of Cairns et al. should be used to estimate root biomass as a function of aboveground volume. I suspect that the methods of Jenkins et al., 2003, in *Forest Science*, 49(1): 12-35 are more reliable than Cairns, but I do not have definitive evidence for this. At minimum, the Jenkins methods should be recognized and allowed.

Appendix A, Step 2 talks about using allometric equations that use both tree height and diameter to estimate biomass. This approach is correct, and vastly more reliable than using only diameter. However, the bole biomass equations given in Table A.3 use volume, not height and diameter. A variety of equations are available for North American tree species that use both height and diameter to estimate biomass. See:

> Smith, Gordon R., Bruce A. McCarl, Changsheng Li, Joel H. Reynolds, Roel Hammerschlag, Ron L. Sass, William J. Parton, Steven M. Ogle, Keith Paustian, James Holtkamp, and Wiley Barbour. 2007. *Harnessing farms and forests in the low-carbon economy: how to create, measure, and verify greenhouse gas offsets*. Edited by Zach Willey and Bill Chameides. Raleigh, NC: Duke University Press, Nicholas Institute for Environmental Policy Solutions. 229 p.

for a relatively broad set of equations, and for guidance on adapting equations for one species to another species.

Section C.5, summarizing risk assessment states that one should add the risks to get the cumulative risk. I believe that you wish to compound the risks, multiplying

$(1\text{-}Risk_1) * (1\text{-}Risk_2) *... * (1\text{-}Risk_n)$

for risks 1 through n.