RESPONSE TO PUBLIC COMMENTS

ACR's *Methodology for Afforestation/Reforestation of Degraded Lands* was approved in March 2011. The methodology is applicable to projects worldwide conducting afforestation and reforestation (A/R) on lands that are expected to remain degraded or continue to degrade in the absence of the project. The methodology was originally based on the Clean Development Mechanism (CDM) approved consolidated afforestation and reforestation baseline and monitoring methodology AR-ACM0001 Version 5.0.0. A modification to include guidance on accounting for harvested wood products, and make other clarifications, was approved through the ACR AFOLU Technical Committee process in 2011.

In a second modification, the USDA Forest Service in 2012 proposed adding its Forest Vegetation Simulator (FVS) as an approved tool to estimate carbon stock changes in A/R projects. This proposed modification was also reviewed by the ACR AFOLU Technical Committee, which recommended approval in May 2013.

The modified version 1.1 was posted for public comments from June 12 – July 12, 2013. Public comments and responses are given below.

Section I. Source, Definitions and Applicability

	Comment	Commenter	Response	Changes to Methodology
1.1	**FVS applicability limitation to US:** With some non-US variants of FVS available and potential for more variants it appears to be a loss to restrict FVS application to the US only. We understand	Dr. Jacqueline Gehrig-Fasel, TREES Forest Carbon	Since there are no current protocols to evaluate models created outside the USFS, only US variants developed by the USFS are allowed at this time.	None

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	that USFS is not responsible for the adapted models but considering that a validator/verifier generally has to review parameters and models (even when using in the classic "CDM" approach), it seems possible to allow such adaptations for FVS as well. This would require transparency on models and parameters used (which should actually also be case for US projects) and a set of quality requirements for these models and parameters (e.g. project specific or regional, peer-reviewed sources, …). Validators would need to be able to understand impact of the parameters on the model outcome and carbon quantification.	Consulting	After evaluation protocols have been developed, ACR may be open to the possibility of approving non-US and non-USFS-developed FVS variants.	

Section II. Baseline Methodology Procedure

	Comment	Commenter	Response	Changes to Methodology
2.1	With regard to the necessity of modeling existing remnant tree growth and predicting natural regeneration– ERTs are to be awarded to the project developer in proportion to carbon that is sequestered as a result of project activities. In the case of AR projects, the primary activities eligible for crediting are planting and tending of those planted trees to increase stocking above what would occur naturally. That is, the additionality is in the <u>planted</u> trees. Trees that are not planted, whether they are remnants of the pre-disturbance forest or natural regeneration, cannot be	Larry Wilson, SCS Global Services GHG Verification Forester	Although it may be relatively easy to distinguish planted trees from natural regeneration immediately after planting, it becomes increasingly difficult to do so as the project progresses through time. As a result, the requirements for including natural regeneration in the baseline and project	Changes were added to clarify the fact that individual remnant trees within the project boundary may be tagged and excluded from both the baseline and project calculations if desired.

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	added to the project side of the net GHG calculation without also subtracting them from the baseline because they are not additional and must not count toward the net benefit. There are 2 options for dealing with remnant trees and natural regeneration: 1) include them in the baseline and ex-ante modeling and monitor their growth in the ex-post monitoring plots; or 2) exclude them from the baseline scenario, identify and mark them on the ex-post monitoring plots, and exclude them from the ex-post carbon stock estimates. In the first case, which I believe is the standard approach; project proponents include remnant trees in the initial inventory and stocking estimate and make assumptions regarding natural regeneration or the lack of it. The baseline scenario is modeled based on these assumptions, relying on the model to predict the growth and mortality of the remnant trees. The ex-post monitoring would measure all trees on the monitoring plots; planted trees, remnants, and natural regeneration. Net GHG removals are the difference between stocking of all trees on the monitoring plots and the stocking predicted under the baseline scenario. Uncertainty in predicted growth of remnant trees and predicted natural regeneration in the model becomes incorporated into the net GHG removals. Note however, that the death of a remnant tree on a monitoring plot that is not predicted by the baseline modeling would		calculations as well as establishing a regeneration monitoring area are left unedited. The intent on page 5 was to suggest that remnant trees can be included or excluded, as long as this is consistent between the baseline and project calculations. Clarification was added to reflect this.	

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	affect the net GHG removal calculation conservatively. In the second case, project proponents mark all remnant trees occurring on the monitoring plots and any naturally regenerating trees that establish on the monitoring plots. It is relatively easy to distinguish between planted trees and natural regeneration. The remnants and naturals may be measured during monitoring events, but under this method, they would not be included in the stocking estimates, either baseline or ex-post. The appropriate baseline scenario is that no trees were planted, therefore baseline stocking is zero. Net GHG removals is simply the current biomass in planted trees. There is no uncertainty in the estimate introduced by modeling. The trees that introduce the uncertainty in the first case above, are simply ignored in the calculation of net GHG benefit. Only the planted trees are quantified, which corresponds exactly to the trees that make the project additional.			
2.2	**Baseline scenario calculations:** With an increase of biomass in the baseline, it is quite reasonable to assume that dead wood, litter and potentially soil organic carbon pools could also increase. These pools would thus most likely have to be considered as well (maybe with the exception of litter which ACR considers as a priori insignificant). Taking this one step further, one could say that if baseline stock increase can be credibly modeled for all relevant pools	Dr. Jacqueline Gehrig-Fasel, TREES Forest Carbon Consulting	Removal of the degradation applicability condition (I. 4(a)) would be a significant change to the current methodology and may require other, associated changes to the methodology. It would also have to undergo another review by the ACR AFOLU	None

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	and leakage is also considered, the "degradation" requirement could actually be dropped (as did the UNFCCC in its consolidated CDM A/R methodology AR-ACM0003). The revised ACR methodology even allows for the calculation of harvested wood products in the baseline with FVS, thus widening the scope considerably. The remaining condition would be that the forest in the baseline scenario is not expected to grow enough to exceed the forest threshold criteria. However, the non-FVS part of the methodology would have to be reworked to make sure that all relevant pools are accounted for in the baseline scenario. Also, it should be said that all these more open approaches will lead to an increase of effort and complexity for project developers (and thus development cost).		Technical Committee. We acknowledge the point that dead wood and litter could nominally increase, but we think this is going to be *de minimis* and so we are electing not to include those in the baseline calculation.	
2.3	**Standing deadwood calculation:** If using FVS for ex post calculations, the use of inventory data for standing deadwood should be required. As the presence of deadwood depends on a variety of factors, not all of which are covered in a model, deadwood carbon stocks should be based on actual data rather than just on a mortality and decomposition model which could be biased or inaccurate for a specific site.	Dr. Jacqueline Gehrig-Fasel, TREES Forest Carbon Consulting	Dead wood is accounted for unless dead wood in the baseline scenario can be expected to decrease more or increase less, relative to the project scenario. As a result, the exclusion of this pool is always conservative.	None

Section III. Monitoring Methodology

	Comment	Commenter	Response	Changes to Methodology
3.1	**Regeneration monitoring areas:** We are concerned that the introduction of the regeneration monitoring areas will lead to considerable difficulties for project proponents. While this may not be much of an issue for US projects, it will be very challenging for some international activities. For many projects, securing such an area (close but not too close to the project area, with the same structure and expected development) will pose a problem. In some cases this will be due to land tenure issues - it is often difficult enough to secure the project area in the long term - for others it will be difficult to even find such an area. Furthermore, it has to be considered that often the mere presence of the project in the area can lead to changes in the neighboring areas (positive, e.g. by redirecting degrading activities towards other activities, or negative, i.e. through leakage of activities from the project area). We thus harbor doubts about the objectivity of such nearby monitoring plots, especially if they are small in size (and not a full scale reference area). And a more technical note: the methodology requires counting of seedlings in the regeneration areas and defines a maximum deviation from the assumptions on number of seedlings - which usually is not part of a non-	Dr. Jacqueline Gehrig-Fasel, TREES Forest Carbon Consulting	The ACR AFOLU Technical Committee felt very strongly about the need to monitor regeneration rates. It is suggested, but not required, that the regeneration monitoring area be located far enough away to avoid regeneration due to seeds from the trees planted in the project area. Because this is not a requirement, one could always carve the ¼ hectare necessary for the monitoring area out of the project area.	None

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	FVS project documentation - but does not say anything about their chance of survival or growth to adult state (though it mentions an increase in “trees per hectare” so this might be more of a wording issue). Finally, it is important to consider that this monitoring requirement and effort will impact the project economy, first through the additional efforts for work and potentially land tenure, second for the uncertainties this creates for the future project benefits. As other methodologies and standards have rather moved towards regional or landscape level approaches for baseline assessment, the approach in the proposed methodology seems cumbersome and prone to bias. For these reasons, we would in fact prefer a simple “no lasting regeneration” requirement to the monitoring solution.			

Section IV. Estimates Using the Forest Vegetation Simulator

	Comment	Commenter	Response	Changes to Methodology
4.1	FVS is a powerful and complex tool that comes in many variations. The US Forest Service FMSC website currently lists 20 regional variants of FVS from Alaska to the southern US. Many of the variants are further subdivided into sub units corresponding to National Forests or latitude, with predicted growth rates by	Larry Wilson, SCS Global Services GHG Verification Forester	If the FVS variant used is not the one indicated by the variant map, then documentation should be required. In most cases, species not modeled by a	Additional text was added to section IV that says any variant or species substitutions must be documented,

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	species varying for each subunit. It is therefore important that the Methodology require the project developer to disclose the FVS Variant being used and to demonstrate why that particular variant, including the local sub-variant if applicable, is most suitable to the project circumstances. This demonstration should address species composition and geographic attributes at a minimum. If a species occurring on a project is not recognized by the FVS variant being used, the species substitution should be identified and justified, since the species substitution will determine the biomass equations used in the carbon stock estimates. Much of the relevant information in this regard is contained in the individual variant documentation.		given variant will get mapped internally by FVS to another species. In the case where users deviate from the suggested variant and/or species substitution, this should be documented.	along with the rationale behind them.
4.2	FVS comes with a number of levers and switches that allow a skillful user to customize the model behavior to correspond to local conditions. These levers and switches send instructions to the FVS model in the form of KEYWORDS which form the instruction set for each FVS run. In order to verify that FVS is being used appropriately, project proponents should be required to make all Keyword files or Output files available at verification. Project proponents should also be required to make the input data, whether in text files or database, available to VBs upon request.	Larry Wilson, SCS Global Services GHG Verification Forester	This is listed as a requirement (#8) in section IV, but the earlier language was vague about whether the keyword files are required for review.	FVS keyword files were added to the list of files that must be provided for review.
4.3	**Using FVS for carbon calculations:** Availability of a model incorporating tree biomass calculations and growth is indeed a relief for many	Dr. Jacqueline Gehrig-Fasel, TREES Forest	References to the pertinent documentation are already included in the methodology.	Updates were added to section IV to clarify that fact that

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	project developers struggling with carbon calculations. However, for a broad practical application it is crucial that guidelines and requirements are given concerning the use and potential applicability restrictions of the tool and underlying models, e.g. for growth, mortality, harvested wood products. Reading the proposed methodology and appendix describing FVS we felt that some more transparency and guidelines would help. It may be that such information is available elsewhere on the FVS websites but we believe that specific references and especially the limitations and requirements of the model should be given in the methodology appendix. Also, guidance should be given how to handle or initiate updates and changes in the model or how to develop a new variant. In fact, it might even be worth adding a quality assurance process and model/parameter requirements (source, quality review, verification) in case a project developer wants to use FVS for a non-US project (see also next comment below).	Carbon Consulting	No guidance was added regarding development of new variants given that currently only USFS-developed US variants are allowed. Expansion to include other variants may be appropriate for future methodology updates. Additional guidance is necessary in terms of whether or not to update FVS software mid-project.	updated software may be used mid-project. If the FVS software used is updated mid-project, consistency must be maintained so both the baseline and project calculations must use it.