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Carbon Sequestration via Tree Planting on Agricultural Lands:
An Economic Study of Costs and Policy Design Alternatives

Bruce A. McCarl
Professor of Agricultural Economics
Texas A&M University
and
Principal, McCarl and Associates

Many countries are involved in international negotiations designed to rollback emissions of greenhouse gasses. One agreement arising out of these negotiations is the Kyoto Accord (KA). In the KA, United States negotiators have agreed to a seven percent rollback in greenhouse gas emissions from 1990 levels by the 2008 to 2012 period. Such a rollback may not entirely come to pass as the KA has yet to be ratified by the U.S. government. (Even if it is Hamilton argues that the emission targets under the KA's accounting scheme are substantially greater than 1990 emissions.) Nevertheless, the international effort surrounding the formation of the KA indicates that there will likely be pressures to rollback and/or offset emissions in the next few decades.

One feature of the KA is the definition of sinks. Countries may be able to offset increased emissions of greenhouse gasses with processes which fix greenhouse gasses into long lasting storage pools (called sinks). The KA permits trading wherein emitters of greenhouse gasses could acquire emission rights by paying others to expand the size of greenhouse gas sinks. One possible sink involves the expansion of forested acres on current agricultural lands by planting trees. Such an expansion increases the amount of carbon held in the ecosystem (hereafter called carbon sequestered) because as trees grow they remove carbon from the atmosphere and sequester it in the soil and wood. One

economic question regarding this possibility is: What is the relative cost of stimulating tree planting vs. that of directly reducing emissions within the primary emitting sectors. If the cost of establishing sinks is substantially less than the cost of reducing emissions, then contracts may be established which pay agricultural landowners to plant trees so as to increase the amount of carbon sequestered.

In this study, two issues are examined. First, we examine the relationship between the volume of carbon sequestered by tree planting activities and the subsidy paid. Second, we examine how provisions of agreements designed to stimulate tree planting on agricultural lands affect program cost and net carbon sequestration.

The focus on the provisions of tree planting agreements merits further explanation. Tree planting agreements have been discussed as potential ways to move large quantities of land from the agricultural to the forestry sector. Such a land movement should be expected to require subsidies. In particular, the market for land should have allocated land such that the value of land is in a near equilibrium state with land values being approximately equal on the margin in both sectors. Moving large quantities of land between the sectors would unbalance that equilibrium. For example, the reduction of land in agriculture would raise agricultural prices, while the influx of land into forestry would, at some point in the future, decrease forestry prices (Adams et. al. present results consistent with this statement). Such price movements would raise incentives for countervailing land transfers. Movements in relative prices of land in the two sectors would provide existing forest landowners with incentives to either transfer their forested lands land to agriculture or to deintensify management. Carbon sequestration involved policy and programs could focus on the primary movement of agricultural lands without considering the effects on the utilization of existing forest lands. Thus, we study how provisions restricting harvest on sequestered lands and provisions regarding deforestation on

existing forest lands affect the cost and net carbon gains under a sequestration program. We will also investigate design aspects of the tree planting subsidy program regarding the effects of subsidizing acreage vs. potential carbon productivity.

Methodology

The analysis will be done using the FASOM model (Adams et. al.). FASOM simulates the productivity and economic implications of land use in both the forestry and agricultural sectors as well as the movement of land between the sectors. FASOM is a 90 year, 11 region model of U.S. forestry and agriculture in a setting which is open to trade. Details on the forestry model appear in the article by Adams et al., while details on the agricultural and forestry model as well as the linkages between them appear in the paper by Alig et al.

The basic methodology employed will involve running FASOM repeatedly with successively higher prices for program enrollment. All sequestration incentive payments are assumed to be made at the initiation of the program, which will be considered the year 2000. Alternative schemes for the nature of the payments to land enrolled in the sequestration program will be examined with both land-based and productivity based payments simulated. We will also vary the minimum allowed harvest age for land enrolling in the program and will impose alternative restrictions on forest to agricultural land transfers.

In turn, we will observe the amount of carbon sequestered and the cost per unit sequestered in the 2010, 2020 and 2030 time frames. We will also examine policy provisions which would address possible responses by the existing forest sector to large amounts of acreage being moved in. In particular, the provisions will address the acceptability of countervailing land transfers, and a minimum level for rotation length.

All in all seven major scenarios will be examined

1. Base case situation without a carbon sequestration program
2. Imposition of a program with payments based on the acres enrolling in the program with timber harvest never allowed on the acreage.
3. Imposition of a program with payments based on the amount of carbon present in 2040 on the acreage enrolled in the sequestration program, with timber harvest never allowed.
4. Imposition of a program with payments based on the amount of carbon present in 2040 on the acreage enrolled in the sequestration program. Land enrolled in the sequestration program is not allowed to be harvested until after 50 years. No restrictions are imposed on land transfers from forestry to agriculture
5 Imposition of a program with payments based on the amount of carbon present in 2040 on the acreage enrolled in the sequestration program with harvest allowed at the landowners discretion. No restrictions are imposed on land transfers between forestry and agriculture
6. Imposition of a program with payments based on the amount of carbon present in 2040 on the acreage enrolled in the sequestration program with land allowed to be harvested at the landowners discretion. Land transfers are limited to those observed in the base model solution. This does not permit the newly sequestered acres to transfer back to agriculture, but does allow forested acreage outside the sequestration program to transfer in quantities up to the amount that was transferred without the sequestration program.

7. Imposition of a program with payments based on the amount of carbon present in 2040 on the acreage enrolled in the sequestration program, with land allowed to be harvested at any time and land transfers from forestry to agriculture prohibited.

Characteristics of the Base Model Solution

Before beginning a discussion of the results of the scenarios, there are key characteristics of the two sectors which are reflected in the base model solution and merit discussion. Agriculture is undergoing a transition. The farm program, production related, target price and deficiency payment programs were eliminated in the 1996 farm bill in favor of payments that are not linked directly to agricultural production. However, largely due to low international stocks, the prices received by farmers did not fall immediately. But, commodity prices have been on a downward trend since the farm program revisions. Also the acres enrolled in the early sign ups of the conservation reserve program are coming up for renewal or expiration. However, USDA has decided to reduce the total number of acres enrolled. Collectively, these phenomena portend lower agricultural commodity and lower derived demand for agricultural land. Simultaneously, in the forest sector, the rate of growth in forestry production exhibited in the last couple of decades in the Southern states is not sustainable and it is even questionable whether the absolute level of recent production in the South is sustainable. Consequently, the forestry sector may exhibit a pattern of initially rising land prices. These phenomena are reflected in the FASOM solutions. In particular, forest prices rise for the first couple of decades, then after 30-40 years the value of forested land begins to fall. The net effect of the low prices in agriculture coupled with the higher prices in forestry is that in the base FASOM solution there are substantial land transfers in the initial time periods from agriculture to forestry with roughly 16.7 million acres transferring in the

first three decades. This is matched later in the model in the years 2050 and beyond by 24.4 million acres transferring back from forestry to agriculture.

FASOM Carbon Accounting

One key output item in this study is the carbon quantities arising under different program payment and program design setups. As background for those examining these results, it is worthwhile discussing characteristics of the FASOM carbon calculations. The FASOM carbon treatment was designed by Callaway based on the work of Birdsey and colleagues. FASOM accounts for carbon storage in four pools at the end of each decade. Three of these pools are directly related to forestry and involve soils, growing trees, and harvested forest products. The other pool is soil carbon on agricultural lands.

Forest Soil Carbon

In terms of the forest soil (using a broad definition of soils that includes the logging residue and underground roots) four key accounting practices are employed. First and fundamentally, the soil carbon quantity depends upon

a) rotation length,

b) whether or not the land is newly migrating over from agriculture or has been in forest usage for at least one rotation,

c) the region, and

d) whether the stand is predominately made up of hardwoods or softwoods.

Second, once land is harvested, the carbon in the roots and logging residues as well as burned slash is assumed to decay at different rates. However, if the harvested land migrates out to agriculture, the soil carbon is assumed to fall to the agricultural level within the decade of transfer.

Third, the data used to compute carbon sequestration on land migrating into forestry from agriculture differs from that used for land that has previously been in forestry usages. In particular, soil carbon accumulation during the first forest rotation is assumed to differ from the accumulation rate for all subsequent forest rotations. In both cases, the rate of soil carbon accumulation depends on rotation length, and region.

Fourth, when land moves into forestry from agriculture the carbon increment computed in FASOM is the forest carbon estimate minus the carbon that would have been present in the soils under a typical agricultural use.

Tree Carbon

The second FASOM carbon pool involves the carbon sequestered in growing trees. There carbon sequestration volume is computed as a function of the amount of merchantable timber. The merchantable timber volume comes from the growth and yield tables in FASOM coupled with the endogenous choice of harvest age and tree planting. The merchantable volume data depend on region, predominant species, land capability, management applied, and tree age length.

Harvested Forest Product Carbon

The third FASOM carbon pool involves carbon stored in harvested timber products. As trees age, the share of the merchantable timber that can go into pulp, fuel wood and saw timber uses changes. The speed with which carbon initially entering the post harvest pool is eventually released into the atmosphere depends on product. FASOM contains product specific data on post harvest carbon emission rates.

Agricultural Soils Carbon

The fourth FASOM carbon pool involves carbon sequestered in agriculture soils. The agricultural soil carbon data varies by region and type of land use. Crop and pasture land usages are distinguished. No attempt is made within FASOM to differentiate agricultural soils carbon storage capability by crop grown. Nor is tillage or crop rotation included as a factor.

Timing of FASOM carbon

In FASOM carbon accounting the date selected for carbon accumulation calculation was the end of the decade. Thus, the carbon quantity reported for the first decade is assumed to be that on hand 10 years out, while the accounting in the second decade gives carbon on hand at the end of 20 years and so forth for all the time periods reported.

Results

As stated above, the model experiments were designed to yield insight into both the cost of acquiring carbon and the potential enrollment from the agricultural sector when sequestering carbon using tree growing. The experiments were also designed to yield information on the implications of different policy designs within the sequestration program. Because the alternative policy designs have a large effect on the cost of carbon we will deal with those results first. Later we will present data on carbon cost including results as affected by policy alternatives.

Policy design results

Program policy design aspects that were examined involve

a) subsidy basis -- whether the subsidy be paid for land or for potential carbon sequestered,

b) provisions for the harvest of the timber, once mature, on sequestered acres -- whether that harvest be entirely at the discretion of the landowner, restricted to

occur no sooner than 50 years from program enrollment date, or never completed

c) provisions regarding land transfers from the existing forest sector -- whether they be freely allowed, restricted to the transfers observed in the base solution, or prohibited.

Each of these aspects will be discussed in turn below.

Subsidy basis

The subsidy basis examined involves the difference in program results when the carbon sequestration subsidy is based on the land area enrolled versus potential carbon. This was examined by simulating program enrollment and consequences when the sequestration payment was expressed either in terms of dollars per acre enrolled or dollars per projected ton of carbon sequestered on the enrolled acreage 40 years after the program began. The potential carbon level used was the FASOM calculation of sequestered carbon at the end of the 2030 decade above and beyond the amount sequestered if that land remained in agricultural use. The payments were assumed to be made at the time that the land was enrolled in the program, and are in current dollars which are assumed to be for the year 2000.

Table 1 contains three sets of results pertinent to the analysis of this question. The result in the first column is drawn from the FASOM land payment based scenarios, specifically the one for the per acre price of $2750 (which is the scenario where total program cost divided by the 2040 carbon yield corresponds most closely to $30 per ton). The second column depicts the results from a carbon potential based sequestration payment program for the subsidy price of $30 per ton. The third column presents data interpolated from the land payment scenario results such that the quantity of 2040 carbon

produced is the same amount as that produced under the $30 dollar carbon based sequestration program. In all three results the assumption was used that the forest products on the sequestered land were not allowed to be harvested.

The FASOM results show that a program design that subsidizes land conversion based on acreage enrolled will result in less carbon for a given per ton price or equivalently a higher total program cost must be paid to yield an equivalent quantity of carbon relative to carbon potential based payment program. For example, when paying $30 per ton about 5 percent less carbon is yielded under the land based payment program as opposed to the carbon based program. Similarly, when trying to get 6.6 billion metric tons of carbon, the land-based incentive program costs approximately 20 percent more than a carbon potential based incentive program.

These results coupled with the history of agricultural programs, make a short discussion of program design from an agricultural policy perspective desirable. Traditionally, many agricultural programs such as the conservation reserve (CRP) and land retirement (set aside,50/92 etc) programs have been based on acres enrolled, not on productivity. The programs based on productivity, such as the deficiency payment/target price or crop insurance programs, have been on a "proven yield" basis with the basis of proof relying on actual production data. Development of a "proven yield" basis for a carbon sequestration program would likely be difficult as trees are not annual crops like corn and it is unlikely that potential enrollees would have historical tree growth productivity records applicable to the land to be enrolled. However, the FASOM modeling results included in Table 1 indicate the desirability of a program payment structure based on potential productivity. Perhaps a sequestration program could be structured which accepts bids as has been done under the CRP program but for bid selection ranks the alternative offers using a scoring rule which takes the bid amount per acre divided by

a forest productivity index. The needed forestry productivity indices could be established on a county or land capability class basis. Such a scoring procedure would lead to the acceptance of bids on a criteria much closer to lowest cost per ton of potential carbon sequestered than what occur under a strict acreage enrolled based program. Another approach that could be tried would involve adapting targeting strategies developed in the recent restructuring of the CRP program. However, experience with those strategies indicates political pressure has weakened their application and might indicate that such a program would be difficult to maintain.

Another factor in consideration of carbon related program design is that certain regions which are traditionally important agricultural areas and big participants in agricultural support programs (i.e. the Great Plains and the Southwest) are relatively unproductive tree growing areas. Such regions could well be (and probably should be) excluded from a forestry based carbon program. This could lead to a politically charged debate if future agricultural programs should involve significant programs structured around tree planting to achieve carbon sequestration objectives.

Harvest restrictions

The second program design issue involved an examination of the effects of restrictions on forest products harvest activities on the enrolled acres. This part of the study was motivated by Adams et al. who found, in a non-dynamic setting, that allowing forest products harvest on sequestered acreage had substantial economic implications for the traditional forest sector. In particular, their results showed significant effects in the forest products markets when the forest products on enrolled acres were harvested. The entry of those products into the forestry market dampened demand for products from the traditional forest sector. In turn, they found that the incentives to out migrate traditionally forested land to agriculture were substantial and that carbon gains from the sequestration program were

significantly offset by reductions in carbon sequestration within the traditional forest sector.

To further investigate the question of harvest policy, three different harvest assumptions for the newly sequestered acres were examined. Namely, the newly sequestered acres

a) could be harvested at any time without restriction.

b) could be harvested only after 50 years, and

c) could never be harvested.

When running the scenarios, attention was restricted to payment schemes based only on carbon, land conversion from forestry to agriculture was freely allowed. FASOM was run for approximately 50 different per ton carbon payments with the prices specified in year 2000 dollars for total carbon sequestered in 2040. The full set of results appears in the appendix. For comparative purposes and simplicity, discussion will be limited here to cases where the price paid for 2040 carbon was $30 in current year 2000 dollars.

The results from this analysis appear in table 2. They indicate a tradeoff between harvest time restrictions and the carbon sequestered by the program. In particular, when enrolled land is never harvested, then enrollments are considerably smaller for the same per ton carbon payment as is the sequestered carbon. Specifically, the quantity of carbon supplied by 2040 when harvest is prohibited is about one-third less than the carbon arising when the forest products can be harvested.

On the other hand, the long-term carbon sequestration effectiveness of the program is greater under harvest prohibition. In the case, when harvest is allowed then the land is not reforested but rather switches back into agriculture after one forestry rotation. Consequently, the carbon gain is greatly diminished after 70 years compared to a program where harvested is prohibited.

There are other important tradeoffs between the program provisions and the net carbon gains

due to reactions from the traditional forestry sector. When harvest is permitted, average management intensity in the traditional forest sector falls from about 2.5 to about 1.7 meaning that the average parcel has been downgraded from being managed somewhere between the low and medium intensity classes to somewhere between the very low and low classes.

Simultaneously, average rotation age on existing forest rises from 41 to 56 years. These changes in management affect the net amount of carbon sequestered. To examine this, we computed the carbon gains under each scenario above and beyond the carbon profile realized in the base model solution. To avoid misleading readers we limit this comparison to results from years 40-70. We do this for two reasons.

1) The differences in the first three decades arise largely because the sequestration program accelerates land transfers. The base model shows transfers of acreage into forestry in the first three decades. However, when a sequestration program which offers an attractive payment for enrolling land in the first decade is simulated, then the base case land transfers that occurred in the second and third decades are accelerated by the payments so that they occur in the first time period. Reporting such results would provide a misleading estimate of carbon gain.

2) The results for the last two decades are not reported as we do not believe in reporting results that close to the model terminal time period.

The consequent results are those labeled beginning with the words "Net carbon" in table 2.

The results show the obvious. Namely, when land cannot be harvested, the carbon gains due to imposition of the sequestration program do not ever decrease, but rather increase over the whole 70 year time frame. However, when land can be harvested then the gain due to the program drops off

dramatically after 40 years. For example, under the any time harvest case, the net carbon gain after 70 years is about five percent of the gain realized after 30 years. Furthermore, while gross gain in carbon after 30 years is about 8.0 billion metric tons, the net gain is closer to 4.2 billion due to offsets because of changed activity and out migration of land from the traditional forest sector.

All in all there are important tradeoffs in terms of harvest provisions and may call for a whole new round of in effect "national parks" where lands are purchased for permanent carbon sequestration usages as opposed to remaining in private hands.

Land transfer limitations

The third program design related issue examined involves land transfers. This examination is motivated by the FASOM results which show, after one rotation when harvest is allowed, that essentially all the enrolled land transfers back to agriculture. We also note that the KA would count deforestation against the countries carbon quota. Thus, as a consequence countries might need to tax/regulate deforestation or equivalently provide additional incentives to keep the land in the forest sector. Three different cases were simulated with respect to the amount of acres that were allowed to shift from a forest use to an agricultural use:

a) unrestricted land transfers

b) no more land was allowed to transfer back than the amount observed in the base FASOM solution meaning that the enrolled acres had to remain in forestry, and

c) no land transfers.

All of this analysis was done under many different carbon payment levels. However, again for simplicity in presentation, we will only tabulate results for the $30 level of payments. Also we will do all the analysis under the assumption that program payments based on carbon and that harvesting is permitted

at any time. The only program design element that changes between scenarios is the land transfer restrictions. Table 3 presents the consequent results.

The results again show a familiar pattern. Namely, the more restrictive the policy on forest land use, the more the program has to pay for acreage enrolling in the carbon sequestration program. When land transfers are blocked, somewhat less than two-thirds of the land enrolls as compared to the case where land can freely transfer. Similarly, the amount of carbon sequestered falls by slightly more than two-thirds. The effect of limiting countervailing land transfers even further lowers the management intensity on existed forested lands. It also lowers the average rotation age. The net carbon results move closer to the gross amount of carbon sequestered when the countervailing land transfers are prohibited and the amount of carbon sequestered in the longer run grows.

This whole investigation raises a private property rights issue. Total compliance with the KA would imply that when we start moving land over from agriculture and forestry, that these movements must not be offset by countervailing land movement from traditional forestry usages to agriculture. This means that total program design should consider features that discourages land movements from the traditional forest sector. This means either that a tax, regulatory or incentive scheme may need to be designed. The incentive scheme would be a particularly challenging policy design question and could be quite expensive. Incentives designed to keep land in forestry might end up paying landowners who had no real intention of ever moving land out of forestry.

If, on the other hand, the program taxes or regulates intersectoral land movements, then a private property rights issue will likely arise such as has been observed when land use has been restricted to preserve endangered species whose habitat is dependent upon private property.

Carbon supply

Now suppose we turn our attention to the question of how much carbon can be sequestered at various prices. An obvious inference from the results above is that the quantity that will be sequestered is a function of the policy setup used. Figure 1 contains a graph of the supply function obtained for 2010 carbon across the major policy setups. The policy setup identification legends used in this figure are detailed in table 4 while the data portrayed are in table 5. These data are computed as the total cost of the program divided by the total quantity of carbon sequestered on enrolled acres in 2010. Figures 2-4 give similar portrayals for the data in 2020-2040 backed by the tables of data in table 6-8. The appendix contains a more extensive set of results on all these runs. Several key points can be developed from these figures.

First, carbon sequestered by 2010, a relevant date when regarding meeting the KA timing, won't necessarily be cheap. Paying a price like 30 dollars generates a cumulative total of 600 million metric tons or considering this took ten years about 60 million metric tons per year. However, paying 30 dollars for carbon in 2020 generates six times as much total sequestered carbon with an annual flux rate three times as high as that realized by 2010 (180 million metric tons). By 2040 cumulative sequestration rises to the neighborhood of 10 billion metric tons with an annual flux rates of about 250 million metric tons. The reason for these results is that trees take time to grow. Both growth rates and soil carbon accumulation accelerates over the first few decades.

Second, the implications of the alternative policy setups as discussed in the first results section are again reflected in the results found here. In particular, the most expensive 2010 carbon comes out of a program where the sequestration payment is based on acres enrolled and the least expensive program comes from a carbon potential based payment program which allows the trees to be harvested without restriction on land transfers.

However, this pattern does not hold up in the long run. Again, for example, we graph the long-term carbon profile for the carbon payment based scenarios at a 30 dollar carbon price in figure 5. Those data show the total carbon under the alternative scenarios vs. the carbon accumulation profile in the base no program case. This shows that the carbon profile under the scenarios that allow the enrolled land to migrate back into agriculture after one forest rotation exhibit carbon sequestration levels after 70 years that are very similar to that realized if sequestration program had never existed.

One additional question which can be examined based on the results involves the regional participation in the carbon sequestration program. The regional acreage enrolling in the carbon sequestration program at the periods program payment levels for the case where timber can never be harvested on the sequestered acreage is graphed in figure 6. These results show that several of the regions participate initially but reach the maximum amount of suitable land relatively quickly. The Corn Belt is one exception where participation starts slowly but continues to grow throughout the payment scenarios.

Pragmatic Assessment – Can This Be Done

One pragmatic question regarding these results is whether or not they are excessively optimistic about potential participation. Several pieces of evidence can be cited relative to whether or not numbers like the ones obtained in here are feasible. First anecdotally somewhere around 20-30 million acres have switched back and forth in the south between forest and agriculture in the last couple of decades indicating that adjustments such as the ones predicted in here are possible in the south. Second, over the first 3 years of the conservation reserve program acreage enrolled went from nothing up to about 34 million acres.

Third, the 1983 PIK program, which paid farmers not to grow crops, cut harvested area by 60 million acres compared to the 1982 land allocation. Collectively these results show that large adjustments in U.S. agricultural acreage in response to economically based incentive programs, such as a carbon sequestration program, have occurred in the past.

Concluding Comments

The above analysis studies the costs and consequences of a carbon sequestration program that would move acreage from existing agriculture into the forestry using the FASOM forest and agriculture sector model. The analysis shows that (obviously under an assumption that FASOM mirrors what would happen in the world) the cost of sequestered carbon and the longevity of the total gains in the carbon inventory depend upon the way that the carbon program is setup. In particular, key questions involve

a) whether the carbon program is setup to pay based on acres enrolled or potential productivity of those enrolled acres,

b) whether or not the enrolled forested lands are allowed to be harvested, and

c) whether or not countervailing land transfers from forestry to agriculture are allowed.

Carbon is least costly in the short run when land can be harvested and forest to agricultural land transfers are permitted. It becomes more expensive when harvest is prohibited or countervailing land transfers are prohibited. In the longer run when land can be harvested the enrolled acreage transfers back to the agricultural sector unless countervailing land transfers are blocked which raises the cost of carbon gained through the sequestration program. This implies that for a sequestration program to add to the long-term carbon inventory the program must not only be designed to initially enroll acreage, but also to keep the acreage in forestry usages after one rotation and also discourage countervailing

transfers from the traditional forest sector.

Regarding the cost of carbon, carbon sequestration becomes successively cheaper over the first few decades of the program. Sequestering enough carbon in a ten year program to attain compliance with the Kyoto Accord leads to a program with annual sequestration rate for removal of carbon from the atmosphere of about 1/4 the rate of accumulation that occurs if one looks out 30 years. Near-term sequestration is much more expensive than longer-term sequestration. The quantitative results on the exact projected price quantity schedule of carbon sequestration volumes are given in figures 1-4 and tables 5-8.

Table 1 Results under a Land vs a Carbon based program payment

		Basis for Sequestration Payment		
		Land	Carbon	Land
Price paid for carbon or land	(2000$/Unit)	31.00	30.00	36.03
Acres enrolled in sequestration program	(M Acres)	66888	71183	74522
Total carbon sequestered in 10 years	(MMT)	1185	1284	1338
Total carbon sequestered in 20 years	(MMT)	2851	3183	3225
Total carbon sequestered in 30 years	(MMT)	4393	4934	4951
Total carbon sequestered in 40 years	(MMT)	5859	6596	6596
Total program cost	(B 2000$)	184	198	238
Program cost per acre enrolled	(2000$/Ac)	2750	2780	3187

Notes on the table

1) 2000$/Ton is year 2000 dollars per ton of carbon
2) M Acres stands for thousands of acres
3) MMT stands for million metric tons
4) B 2000$ is Billion 2000 dollars
5) Carbon sequestration numbers gives the total amount of carbon sequestered by the acreage enrolled in the program by a given time period. They would need divided by the number of years to get the annual rate of sequestration.

Table 2 Cross Scenario Comparison for Harvest Restrictions when paying $30 per ton carbon

		Harvest Assumption		
		Never	> 50yrs	Anytime
Acres enrolled in sequestration program	(M Acres)	71183	100804	105955
Total carbon sequestered in 10 years	(MMT)	1284	1996	2130
Total carbon sequestered in 20 years	(MMT)	3183	4868	5144
Total carbon sequestered in 30 years	(MMT)	4934	7314	7711
Total carbon sequestered in 40 years	(MMT)	6596	9601	10115
Total carbon sequestered in 50 years	(MMT)	8242	11839	8022
Total carbon sequestered in 60 years	(MMT)	9629	8906	5329
Total carbon sequestered in 70 years	(MMT)	10661	5720	3519
Net carbon sequestered over base 40 years	(MMT)	5343	6367	5738
Net carbon sequestered over base 50 years	(MMT)	6415	6766	4267
Net carbon sequestered over base 60 years	(MMT)	7366	4963	1917
Net carbon sequestered over base 70 years	(MMT)	8488	3258	963
Nat. avg. management intensity on exist	(Index)	2.49	1.99	1.74
Nat. avg. management intensity on enroll	(Index)	3.31	3.39	3.38
Nat. avg. rotation age exist forest	(Years)	40.97	49.76	55.89
Nat. avg. rotation age sequestered forest	(Years)	45.43	53.77	56.45
Acres from ag to forest in first decade	(M Acres)	71183	100804	105955
Acres from forest to ag in first decade	(M Acres)	15031	15525	15494
Acres from forest to ag decades 2 and 3	(M Acres)	7202	6935	6928
Acres forest to ag decades 4 and beyond	(M Acres)	5290	101245	106869

Notes on the table

1) M Acres stands for thousands of acres
2) MMT stands for million metric tons
3) Carbon sequestration numbers gives the total amount of carbon sequestered by the acreage enrolled in the program by a given time period. They would need divided by the number of years to get the annual rate of sequestration.
4) Net Carbon measures the gain over the base model solution
5) MIC stands for National average Management Intensity Class. It is based on 4 management classes ranging from very low (1.00) to high (4.00)
6) Rotation Age measures the national average time to harvest for the trees

Table 3 Cross Scenario Comparison on Effect of Limited Land Transfers

Result		Land Transfer Assumption Free	Base Only	None
Acres enrolled in sequestration program	(M Acres)	105955	78685	68192
Total carbon sequestered in 10 years	(MMT)	2130	1483	1254
Total carbon sequestered in 20 years	(MMT)	5144	3715	3141
Total carbon sequestered in 30 years	(MMT)	7711	5598	4801
Total carbon sequestered in 40 years	(MMT)	10115	7334	6345
Total carbon sequestered in 50 years	(MMT)	8022	5759	4542
Total carbon sequestered in 60 years	(MMT)	5329	3190	2068
Total carbon sequestered in 70 years	(MMT)	3519	1962	1158
Net carbon sequestered over base 40 years	(MMT)	5738	3509	3613
Net carbon sequestered over base 50 years	(MMT)	4267	3532	3550
Net carbon sequestered over base 60 years	(MMT)	1917	3720	3890
Net carbon sequestered over base 70 years	(MMT)	963	3946	4925
Nat. avg. management intensity on exist	(Index)	1.74	1.70	1.68
Nat. avg. management intensity on enroll	(Index)	3.38	3.43	3.44
Nat. avg. rotation age exist forest	(Years)	55.89	49.07	47.36
Nat. avg. rotation age sequestered forest	(Years)	56.45	49.33	45.39
Acres from ag to forest in first decade	(M Acres)	105955	78685	68192
Acres from forest to ag in first decade	(M Acres)	15494	6543	0
Acres from forest to ag decades 2 and 3	(M Acres)	6928	10653	0
Acres forest to ag decades 4 and beyond	(M Acres)	106869	24412	0

Notes on the table

1) MT stands for metric tons
2) MMT stands for millions of metric tons
3) M acres stands for thousands of acres
4) Total carbon gives the cumulative carbon sequestered one by a given time period. They would need divided by the number of years to get the annual rate of sequestration.
5) Net Carbon gives the gain being carbon sequestered over the base model solution
6) MIC results report National average Management Intensity Class. It is based on 4 management classes ranging from very low (1.00) to high (4.00)
7) Rotation Age measures the national average time to harvest for the trees

Table 4 Legends for the graphs

Graph Legend Label[1]	Basis for Carbon Payment[2]	Harvest Assumption on Sequestered Land[3]	Forest to Ag Land Transfer Assumption[4]
l-trn-noh	Land	Never Allowed	No Restriction
c-t-noh	Carbon	Never Allowed	No Restriction
c-h-50yr	Carbon	Only after 50 years	No Restriction
c-trn	Carbon	Freely Allowed	No Restriction
c-h-bsldt	Carbon	Freely Allowed	No More than in Base Solution
c-h-noldt	Carbon	Freely Allowed	No Transfer Allowed

Notes on the table.

1. These mnemonics are the legends found in figures 1-3.
2. Carbon payments are either based on either: a) the current amount of land enrolled in the sequestration program or b) the carbon that would be realized on enrolled land 30 years after the program begins (in year 2040).
3. Land in the sequestration program is either: a) never allowed to be harvested, b) allowed to be harvested only after 50 years from the beginning of the program, or c) freely allowed be harvested whenever harvest is justified by the inventory of forest products.
4. Land is allowed to transfer from forestry to agriculture either: a) without restriction, with the maximum quantity transferring limited to the amount found transferring the base solution which means the newly enrolled acres cannot land transfer back or c) under no circumstances.

Table 5 Results for carbon in 2010-5 across scenarios
Cost gives $ per Total ton Carbon accumulated by this year
Quantity gives Total tons Carbon accumulated by this year in MMT
Note the costs vary from the price paid because these results
tell how much it costs for the earlier accumulation stages in Kyoto

Scenario	l-trn-noh			c-t-noh			c-h-50yr			c-trn			c-h-bsldt			c-h-noldt		
Seq Pay	payland			paycarb			paycarb			paycarb			paycarb			paycarb		
Harvest	NEVER			NEVER			50yrs			anytime			anytime			anytime		
Land Tran	free			free			free			free			noextra			none		
Price Paid for 2040 Carb	Cost	Cumul. Quantity	Annual Quantity	Cost	Cumul. Quantity	Annual Quantity	Cost	Cumul. Quantity	Annual Quantity	Cost	Cumul. Quantity	Annual Quantity	Cost	Cumul. Quantity	Annual Quantity	Cost	Cumul. Quantity	Annual Quantity
2	0.00	7	0.75				0.00	57	5.70	11.09	173	17.32	10.56	147	14.70	0.00	42	4.18
3	47.36	168	16.80				18.19	187	18.72	17.67	272	27.24	17.97	178	17.82	18.12	78	7.82
4	62.25	348	34.79				23.81	308	30.76	23.07	462	46.23	21.72	309	30.87	23.61	119	11.91
5	69.94	534	53.39				29.56	403	40.35	29.07	571	57.12	27.44	349	34.87	29.58	138	13.82
6	87.71	607	60.71	33.42	37	3.72	35.32	492	49.19	34.32	663	66.32	32.90	421	42.08	35.75	157	15.67
7	103.39	756	75.56	39.44	54	5.43	40.89	579	57.94	39.67	761	76.12	38.31	445	44.51	41.99	180	18.02
8	116.96	883	88.32	45.78	106	10.63	45.69	675	67.54	45.06	838	83.81	43.92	455	45.51	48.45	197	19.74
9	130.15	1002	100.16	46.92	164	16.43	49.67	788	78.82	50.35	923	92.29	49.92	485	48.52	54.86	234	23.37
10	142.31	1120	111.97	52.58	200	20.03	54.29	882	88.21	55.47	999	99.87	54.61	563	56.30	61.11	271	27.09
11	155.23	1185	118.50	55.71	286	28.63	58.29	982	98.23	60.32	1076	107.57	58.45	635	63.45	66.90	318	31.81
12	168.07	1270	127.04	58.66	337	33.74	62.07	1131	113.08	64.50	1157	115.71	62.53	716	71.61	72.31	352	35.17
13	180.76	1360	136.03	63.57	369	36.92	66.51	1211	121.11	68.00	1293	129.26	66.71	806	80.58	76.02	419	41.93
14	193.77	1416	141.59	69.28	422	42.16	71.41	1275	127.49	71.84	1386	138.57	72.18	856	85.63	80.59	483	48.33
15	206.73	1456	145.58	75.04	455	45.54	76.36	1348	134.76	75.76	1466	146.60	77.62	895	89.48	85.96	546	54.56
16	219.92	1490	149.01	81.04	514	51.42	81.43	1376	137.59	80.44	1527	152.66	81.07	989	98.86	90.45	590	58.99
17	234.09	1526	152.60	88.03	596	59.60	86.17	1423	142.33	85.33	1568	156.75	85.83	1042	104.16	95.45	646	64.61
18	248.51	1587	158.65	93.96	653	65.33	90.84	1477	147.69	90.04	1620	162.03	90.90	1092	109.18	99.22	729	72.89
19	262.84	1625	162.45	99.71	716	71.64	95.39	1545	154.53	94.82	1655	165.52	95.52	1145	114.50	104.05	774	77.37
20	277.30	1670	167.00	104.98	793	79.28	100.05	1597	159.73	99.69	1677	167.65	99.32	1210	121.00	107.57	845	84.54
21	292.32	1725	172.49	107.68	897	89.70	104.88	1631	163.13	104.30	1736	173.65	103.86	1247	124.70	111.52	886	88.60
22	307.57	1770	177.00	113.53	954	95.44	109.79	1658	165.76	109.06	1768	176.79	108.61	1282	128.16	115.80	932	93.22
23	319.09	1813	181.29	119.06	1003	100.27	114.46	1703	170.27	113.06	1826	182.63	113.33	1324	132.44	120.60	957	95.67
24	329.20	1871	187.08	124.31	1086	108.61	119.10	1750	174.96	117.42	1872	187.22	118.38	1363	136.27	125.28	982	98.20
25	342.34	1912	191.20	129.12	1133	113.34	123.27	1796	179.57	121.87	1901	190.05	123.32	1384	138.45	129.29	1042	104.19
26	354.65	1954	195.41	134.15	1167	116.68	127.57	1841	184.12	125.62	1972	197.15	128.21	1394	139.39	133.72	1103	110.25
27	367.44	1981	198.09	138.95	1193	119.35	131.89	1874	187.45	129.87	2009	200.92	133.09	1410	140.97	137.40	1158	115.83
28	378.13	2022	202.16	143.96	1213	121.26	136.03	1916	191.58	134.33	2033	203.32	138.13	1427	142.68	142.38	1192	119.16
29	390.00	2056	205.57	148.95	1245	124.48	140.15	1959	195.88	138.35	2090	209.02	143.16	1450	144.97	147.09	1217	121.70
30	402.81	2075	207.54	154.08	1284	128.44	144.34	1996	199.55	142.50	2130	212.96	148.37	1483	148.29	151.82	1254	125.38
32	413.58	2117	211.67	163.11	1362	136.23	153.11	2058	205.80	150.91	2201	220.13	158.65	1536	153.56	161.65	1301	130.13
34	425.50	2142	214.20	172.69	1402	140.24	161.53	2126	212.61	160.19	2253	225.29	169.15	1583	158.29	171.74	1332	133.21
36	435.63	2187	218.74	182.52	1441	144.12	170.24	2173	217.25	169.13	2300	229.98	179.49	1625	162.53	181.66	1355	135.51
38	446.28	2232	223.23	192.10	1477	147.68	178.94	2232	223.23	177.87	2363	236.34	189.51	1662	166.20	191.73	1370	137.04
40	456.65	2273	227.27	201.73	1507	150.73	187.89	2270	227.00	186.93	2401	240.06	199.35	1679	167.94	201.83	1402	140.22
45	466.07	2325	232.49	225.76	1579	157.90	209.41	2405	240.52	209.07	2518	251.84	223.90	1705	170.55	226.99	1505	150.47
50				248.93	1696	169.58	231.41	2497	249.73	231.00	2647	264.73	246.44	1792	179.24	251.54	1540	154.03
55				268.35	1839	183.92	253.31	2595	259.55	253.41	2721	272.10	266.85	1919	191.89	272.73	1673	167.33
60				287.86	1974	197.45	275.71	2676	267.61	274.81	2848	284.85	286.31	2062	206.18	292.64	1803	180.31
65				307.78	2091	209.13	297.95	2745	274.45	297.22	2916	291.62	306.90	2163	216.29	313.56	1899	189.92
70				328.46	2180	218.03	319.38	2846	284.59	319.47	2960	296.02	328.32	2237	223.73	334.74	1975	197.46
75				350.12	2234	223.39	341.37	2911	291.08	341.61	2992	299.24	348.93	2324	232.41	356.68	2021	202.11
80				372.07	2277	227.72	363.69	2959	295.91	363.60	3027	302.67	370.14	2386	238.59	377.60	2082	208.15
85				392.61	2356	235.56	386.16	2995	299.53	385.20	3079	307.88	391.46	2443	244.29	398.79	2149	214.93
90				413.65	2416	241.65	408.54	3029	302.89	406.10	3150	315.04	413.20	2484	248.38	418.91	2230	223.05
95				434.58	2474	247.37	430.13	3075	307.54	427.83	3181	318.10	434.28	2533	253.25	440.15	2288	228.78
100				454.86	2553	255.26	450.73	3152	315.22	449.37	3218	321.85	455.80	2583	258.33	460.70	2351	235.07

Table 6 Results for carbon in 2020-5 across scenarios
Cost gives $ per Total ton Carbon accumulated by this year
Quantity gives Total tons Carbon accumulated by this year in MMT
Note the costs vary from the price paid because these results
tell how much it costs for the earlier accumulation stages in Kyoto

Scenario	l-trn-noh			c-t-noh			c-h-50yr			c-trn			c-h-bsldt			c-h-noldt		
Seq Pay	payland			paycarb			paycarb			paycarb			paycarb			paycarb		
Harvest	NEVER			NEVER			50yrs			anytime			anytime			anytime		
Land Tran	free			free			free			free			noextra			none		
Price Paid for 2040 Carb	Cost	Cumul. Quantity	Annual Quantity	Cost	Cumul. Quantity	Annual Quantity	Cost	Cumul. Quantity	Annual Quantity	Cost	Cumul. Quantity	Annual Quantity	Cost	Cumul. Quantity	Annual Quantity	Cost	Cumul. Quantity	Annual Quantity
2	0.00	17	0.87				0.00	148	7.38	3.68	522	26.11	3.49	445	22.23	0.00	135	6.74
3	19.33	411	20.57				6.13	555	27.76	6.27	768	38.39	6.06	529	26.43	6.17	230	11.49
4	25.07	864	43.20				8.42	870	43.51	8.63	1236	61.79	7.89	850	42.49	8.46	332	16.62
5	31.13	1200	59.98				10.65	1119	55.97	10.83	1534	76.70	9.92	964	48.21	10.54	388	19.40
6	37.45	1422	71.09	14.27	87	4.36	12.89	1348	67.38	12.88	1767	88.37	11.83	1170	58.51	12.51	448	22.38
7	43.09	1813	90.65	15.74	136	6.81	15.18	1560	78.01	14.96	2018	100.90	13.78	1238	61.88	14.45	523	26.17
8	48.90	2113	105.63	16.67	292	14.60	17.07	1808	90.40	17.09	2210	110.50	15.75	1269	63.46	16.41	583	29.13
9	54.42	2395	119.76	18.31	421	21.05	18.99	2061	103.05	19.13	2429	121.47	17.70	1368	68.40	18.29	701	35.05
10	59.31	2687	134.33	20.15	523	26.13	21.00	2280	114.02	21.02	2636	131.78	19.55	1572	78.62	20.27	817	40.85
11	64.52	2851	142.54	22.00	725	36.24	22.94	2496	124.80	22.92	2830	141.52	21.33	1739	86.93	22.48	947	47.33
12	69.76	3061	153.04	24.09	821	41.07	24.72	2840	141.98	24.82	3007	150.35	23.33	1919	95.96	24.70	1030	51.48
13	74.95	3281	164.03	26.05	901	45.05	26.77	3009	150.43	26.62	3302	165.12	25.42	2115	105.75	26.46	1205	60.23
14	80.31	3416	170.81	28.07	1040	52.02	28.75	3166	158.30	28.52	3491	174.53	27.52	2246	112.29	28.32	1375	68.77
15	85.56	3518	175.88	30.21	1131	56.56	30.71	3351	167.55	30.44	3649	182.46	29.61	2346	117.29	30.53	1536	76.81
16	90.87	3606	180.32	32.46	1284	64.19	32.65	3431	171.56	32.31	3801	190.04	31.46	2547	127.37	32.49	1642	82.11
17	96.59	3699	184.93	35.12	1494	74.70	34.54	3551	177.54	34.23	3907	195.37	33.42	2675	133.75	34.59	1783	89.14
18	102.29	3854	192.72	37.53	1636	81.78	36.41	3685	184.24	36.10	4041	202.07	35.56	2791	139.55	36.73	1969	98.45
19	108.02	3953	197.64	39.75	1797	89.84	38.24	3855	192.76	38.01	4130	206.48	37.60	2909	145.45	38.79	2075	103.77
20	113.76	4071	203.53	42.12	1976	98.78	40.11	3984	199.22	39.98	4180	209.02	39.60	3035	151.75	40.62	2239	111.93
21	119.69	4213	210.64	44.17	2187	109.34	42.05	4069	203.45	41.76	4337	216.85	41.53	3118	155.90	42.52	2324	116.18
22	125.75	4329	216.46	46.48	2331	116.57	44.01	4135	206.75	43.61	4421	221.04	43.38	3209	160.44	44.66	2417	120.87
23	131.24	4408	220.38	48.50	2461	123.07	45.84	4252	212.58	45.55	4533	226.66	45.20	3321	166.03	46.74	2468	123.42
24	136.75	4504	225.19	50.34	2682	134.11	47.62	4376	218.78	47.43	4635	231.73	47.23	3416	170.79	48.77	2523	126.14
25	142.79	4584	229.20	52.24	2801	140.07	49.55	4468	223.38	49.38	4690	234.52	49.19	3471	173.55	50.89	2647	132.36
26	148.71	4660	233.00	54.25	2885	144.27	51.43	4567	228.35	51.29	4829	241.43	51.12	3496	174.78	53.02	2780	139.02
27	154.39	4714	235.72	56.13	2954	147.71	53.37	4632	231.61	53.23	4902	245.11	53.06	3536	176.81	55.02	2893	144.63
28	159.87	4782	239.08	58.12	3003	150.16	55.31	4712	235.58	55.17	4950	247.50	55.08	3578	178.90	56.99	2977	148.85
29	165.51	4844	242.20	60.11	3085	154.24	57.24	4796	239.81	57.05	5068	253.42	57.10	3635	181.73	58.79	3045	152.24
30	171.25	4882	244.08	62.17	3183	159.14	59.17	4868	243.38	58.99	5144	257.20	59.22	3715	185.74	60.61	3141	157.03
32	176.87	4950	247.48	65.54	3391	169.54	62.99	5002	250.12	62.88	5283	264.15	63.39	3843	192.16	64.48	3262	163.12
34	182.37	4998	249.88	69.24	3498	174.88	66.85	5137	256.84	66.92	5393	269.64	67.70	3955	197.75	68.50	3340	166.99
36	187.80	5074	253.70	72.97	3605	180.25	70.72	5230	261.48	70.85	5490	274.50	71.90	4057	202.87	72.42	3399	169.95
38	193.39	5151	257.57	76.70	3699	184.93	74.65	5351	267.55	74.74	5625	281.24	75.91	4149	207.45	76.43	3438	171.88
40	198.88	5218	260.91	80.57	3774	188.69	78.58	5428	271.38	78.68	5704	285.18	79.81	4195	209.73	80.47	3517	175.85
45	204.31	5304	265.18	90.14	3955	197.74	88.34	5702	285.09	88.53	5947	297.37	89.55	4264	213.20	90.49	3774	188.72
50				99.54	4241	212.05	98.20	5885	294.24	98.30	6221	311.06	99.04	4460	223.01	100.35	3861	193.04
55				109.18	4520	226.01	107.97	6089	304.46	107.94	6388	319.41	108.63	4714	235.69	109.81	4156	207.79
60				118.79	4785	239.23	117.65	6272	313.58	117.83	6643	332.17	118.24	4992	249.62	119.31	4423	221.13
65				128.41	5013	250.63	127.41	6418	320.90	127.81	6781	339.07	127.87	5191	259.57	128.91	4619	230.97
70				138.08	5186	259.32	137.21	6624	331.22	137.65	6870	343.51	137.47	5343	267.17	138.64	4768	238.38
75				147.81	5291	264.57	147.08	6756	337.80	147.42	6934	346.72	147.12	5512	275.62	148.43	4857	242.83
80				157.52	5379	268.95	157.00	6855	342.74	157.19	7001	350.07	156.81	5632	281.59	158.21	4968	248.40
85				167.16	5533	276.63	166.92	6929	346.47	166.87	7107	355.34	166.47	5745	287.23	167.86	5106	255.30
90				176.82	5653	282.66	176.84	6997	349.86	176.56	7246	362.30	176.17	5825	291.27	177.50	5264	263.19
95				186.51	5764	288.19	186.60	7089	354.47	186.34	7303	365.17	185.89	5916	295.82	187.10	5382	269.10
100				196.07	5922	296.08	196.30	7238	361.88	196.08	7376	368.80	195.51	6023	301.14	196.78	5503	275.17

Table 7 Results for carbon in 2030-5 across scenarios
Cost gives $ per Total ton Carbon accumulated by this year
Quantity gives Total tons Carbon accumulated by this year in MMT
Note the costs vary from the price paid because these results
tell how much it costs for the earlier accumulation stages in Kyoto

Scenario	l-trn-noh			c-t-noh			c-h-50yr			c-trn			c-h-bsldt			c-h-noldt		
Seq Pay	payland			paycarb			paycarb			paycarb			paycarb			paycarb		
Harvest	NEVER			NEVER			50yrs			anytime			anytime			anytime		
Land Tran	free			free			free			free			noextra			none		
Price Paid for 2040 Carb	Cost	Cumul. Quantity	Annual Quantity	Cost	Cumul. Quantity	Annual Quantity	Cost	Cumul. Quantity	Annual Quantity	Cost	Cumul. Quantity	Annual Quantity	Cost	Cumul. Quantity	Annual Quantity	Cost	Cumul. Quantity	Annual Quantity
2	0.00	29	0.97				0.00	239	7.97	2.36	815	27.15	2.24	693	23.11	0.00	207	6.91
3	12.38	642	21.41				3.92	870	28.99	3.99	1206	40.21	3.89	822	27.41	3.93	361	12.02
4	16.28	1331	44.35				5.32	1377	45.90	5.41	1971	65.71	5.18	1293	43.11	5.34	526	17.55
5	20.73	1801	60.03				6.70	1780	59.35	6.77	2453	81.78	6.50	1473	49.09	6.66	614	20.45
6	24.93	2136	71.22	8.57	145	4.83	8.08	2151	71.69	8.11	2808	93.59	7.77	1782	59.41	7.94	705	23.51
7	28.29	2762	92.06	9.69	221	7.37	9.48	2498	83.28	9.45	3194	106.48	9.06	1883	62.77	9.21	822	27.40
8	31.68	3261	108.70	10.60	459	15.31	10.78	2863	95.42	10.81	3494	116.48	10.35	1931	64.38	10.47	913	30.43
9	35.08	3716	123.87	11.82	652	21.73	12.09	3238	107.94	12.14	3829	127.63	11.62	2084	69.46	11.71	1095	36.49
10	38.38	4152	138.39	13.06	806	26.88	13.42	3569	118.98	13.43	4126	137.54	12.90	2384	79.47	12.99	1275	42.49
11	41.87	4393	146.43	14.34	1112	37.07	14.73	3888	129.59	14.71	4410	147.00	14.16	2620	87.33	14.36	1482	49.40
12	45.35	4708	156.94	15.73	1258	41.95	15.99	4389	146.31	16.01	4662	155.39	15.49	2890	96.35	15.74	1616	53.85
13	48.85	5034	167.80	17.02	1379	45.98	17.33	4648	154.92	17.28	5086	169.53	16.85	3190	106.33	17.02	1873	62.42
14	52.48	5228	174.28	18.32	1594	53.14	18.65	4881	162.69	18.58	5356	178.55	18.20	3396	113.21	18.31	2128	70.92
15	56.04	5371	179.02	19.66	1738	57.93	19.96	5156	171.87	19.89	5584	186.15	19.53	3556	118.52	19.69	2382	79.38
16	59.63	5495	183.17	21.04	1980	66.01	21.26	5271	175.69	21.18	5799	193.29	20.83	3848	128.27	21.01	2540	84.67
17	63.45	5630	187.68	22.56	2325	77.51	22.55	5439	181.30	22.47	5952	198.39	22.14	4038	134.59	22.35	2759	91.98
18	67.32	5857	195.24	24.01	2557	85.24	23.84	5628	187.61	23.76	6140	204.66	23.51	4222	140.72	23.74	3047	101.56
19	71.16	6000	200.02	25.38	2815	93.82	25.11	5870	195.66	25.06	6264	208.80	24.85	4402	146.73	25.08	3210	107.01
20	75.02	6172	205.75	26.82	3103	103.44	26.40	6053	201.77	26.37	6338	211.26	26.18	4591	153.02	26.36	3449	114.98
21	79.01	6382	212.73	28.19	3426	114.21	27.71	6175	205.84	27.63	6554	218.47	27.49	4712	157.05	27.66	3572	119.07
22	83.05	6555	218.50	29.59	3662	122.08	29.02	6272	209.07	28.91	6669	222.29	28.76	4839	161.31	29.03	3718	123.95
23	86.80	6664	222.14	30.91	3862	128.75	30.29	6434	214.47	30.22	6832	227.73	30.04	4997	166.56	30.38	3798	126.60
24	90.60	6798	226.59	32.19	4194	139.80	31.55	6604	220.14	31.52	6975	232.51	31.37	5142	171.42	31.71	3880	129.34
25	94.67	6914	230.46	33.50	4369	145.64	32.86	6737	224.57	32.82	7056	235.20	32.68	5224	174.14	33.08	4072	135.75
26	98.70	7022	234.05	34.82	4495	149.83	34.15	6878	229.26	34.13	7256	241.87	33.98	5259	175.31	34.45	4279	142.64
27	102.55	7097	236.57	36.12	4591	153.05	35.46	6972	232.41	35.44	7363	245.44	35.28	5318	177.26	35.79	4447	148.24
28	106.32	7190	239.66	37.44	4663	155.42	36.77	7088	236.26	36.75	7432	247.74	36.61	5384	179.45	37.10	4573	152.42
29	110.16	7278	242.60	38.76	4784	159.47	38.08	7210	240.33	38.04	7601	253.38	37.94	5470	182.35	38.37	4665	155.51
30	114.02	7332	244.39	40.11	4934	164.48	39.38	7314	243.79	39.35	7711	257.04	39.30	5598	186.62	39.65	4801	160.04
32	117.87	7427	247.57	42.58	5219	173.95	41.98	7506	250.19	41.97	7914	263.80	42.00	5801	193.37	42.25	4978	165.95
34	121.62	7494	249.79	45.14	5365	178.82	44.60	7700	256.68	44.65	8083	269.43	44.73	5985	199.52	44.90	5095	169.83
36	125.40	7599	253.30	47.70	5514	183.80	47.21	7834	261.14	47.28	8226	274.21	47.44	6150	204.99	47.52	5180	172.67
38	129.25	7708	256.93	50.27	5643	188.10	49.85	8013	267.11	49.91	8423	280.77	50.09	6288	209.61	50.16	5238	174.60
40	133.06	7800	260.00	52.88	5750	191.67	52.48	8127	270.89	52.55	8540	284.66	52.70	6352	211.75	52.82	5358	178.61
45	136.86	7917	263.91	59.36	6005	200.16	59.06	8529	284.29	59.15	8901	296.71	59.23	6447	214.91	59.45	5746	191.52
50				65.81	6414	213.81	65.66	8801	293.38	65.74	9303	310.10	65.70	6723	224.11	66.01	5870	195.66
55				72.36	6820	227.35	72.24	9101	303.37	72.27	9542	318.05	72.22	7090	236.33	72.49	6296	209.85
60				78.90	7204	240.12	78.78	9365	312.18	78.90	9922	330.73	78.76	7495	249.82	78.99	6680	222.66
65				85.44	7534	251.13	85.36	9580	319.33	85.54	10132	337.74	85.29	7782	259.42	85.52	6964	232.12
70				91.98	7786	259.52	91.95	9884	329.48	92.14	10264	342.13	91.81	8001	266.69	92.07	7179	239.30
75				98.53	7938	264.59	98.57	10081	336.03	98.71	10357	345.22	98.35	8246	274.86	98.64	7308	243.61
80				105.08	8064	268.79	105.19	10231	341.02	105.28	10453	348.45	104.90	8419	280.63	105.21	7471	249.02
85				111.61	8286	276.20	111.82	10344	344.81	111.83	10605	353.50	111.43	8582	286.06	111.74	7670	255.67
90				118.15	8460	282.00	118.44	10448	348.25	118.39	10807	360.23	117.98	8699	289.97	118.29	7899	263.30
95				124.70	8621	287.36	125.01	10582	352.73	124.96	10891	363.03	124.53	8832	294.39	124.80	8068	268.95
100				131.22	8848	294.94	131.58	10798	359.92	131.53	10996	366.54	131.05	8985	299.49	131.35	8245	274.82

Table 8 Results for carbon in 2040-5 across scenarios
Cost gives $ per Total ton Carbon accumulated by this year
Quantity gives Total tons Carbon accumulated by this year in MMT
Note the costs vary from the price paid because these results
tell how much it costs for the earlier accumulation stages in Kyoto

Scenario	l-trn-noh			c-t-noh			c-h-50yr			c-trn			c-h-bsldt			c-h-noldt		
Seq Pay	payland			paycarb			paycarb			paycarb			paycarb			paycarb		
Harvest	NEVER			NEVER			50yrs			anytime			anytime			anytime		
Land Tran	free			free			free			free			noextra			none		
Price Paid for 2040 Carb	Cost	Cumul. Quantity	Annual Quantity	Cost	Cumul. Quantity	Annual Quantity	Cost	Cumul. Quantity	Annual Quantity	Cost	Cumul. Quantity	Annual Quantity	Cost	Cumul. Quantity	Annual Quantity	Cost	Cumul. Quantity	Annual Quantity
2	0.00	41	1.04				0.00	329	8.22	2.48	774	19.36	2.34	663	16.59	0.00	259	6.48
3	9.25	860	21.50				3.00	1135	28.38	3.00	1604	40.11	3.00	1067	26.68	3.00	472	11.81
4	12.37	1751	43.77				4.00	1831	45.77	4.00	2666	66.65	4.00	1676	41.91	4.00	703	17.57
5	15.92	2346	58.65				5.00	2385	59.63	5.00	3321	83.03	5.00	1913	47.84	5.00	817	20.44
6	19.23	2769	69.22	6.00	207	5.18	6.00	2895	72.38	6.00	3793	94.83	6.00	2308	57.69	6.00	933	23.34
7	21.60	3617	90.42	7.00	306	7.65	7.00	3384	84.60	7.00	4313	107.83	7.00	2436	60.91	7.00	1081	27.02
8	23.85	4331	108.27	8.00	608	15.21	8.00	3857	96.43	8.00	4721	118.02	8.00	2498	62.45	8.00	1195	29.88
9	26.24	4967	124.17	9.00	856	21.41	9.00	4349	108.73	9.00	5164	129.09	9.00	2691	67.28	9.00	1425	35.62
10	28.74	5544	138.60	10.00	1053	26.32	10.00	4789	119.72	10.00	5539	138.49	10.00	3075	76.86	10.00	1656	41.39
11	31.40	5859	146.47	11.00	1450	36.25	11.00	5206	130.14	11.00	5898	147.46	11.00	3371	84.29	11.00	1935	48.37
12	34.01	6277	156.93	12.00	1649	41.23	12.00	5849	146.23	12.00	6219	155.49	12.00	3731	93.28	12.00	2119	52.97
13	36.67	6705	167.62	13.00	1805	45.14	13.00	6196	154.90	13.00	6762	169.05	13.00	4135	103.38	13.00	2452	61.29
14	39.46	6953	173.82	14.00	2086	52.16	14.00	6502	162.56	14.00	7111	177.76	14.00	4415	110.37	14.00	2782	69.55
15	42.21	7131	178.27	15.00	2278	56.96	15.00	6860	171.50	15.00	7405	185.12	15.00	4630	115.75	15.00	3127	78.17
16	44.97	7288	182.19	16.00	2604	65.11	16.00	7003	175.07	16.00	7675	191.87	16.00	5009	125.23	16.00	3335	83.37
17	47.85	7466	186.64	17.00	3086	77.16	17.00	7214	180.35	17.00	7868	196.71	17.00	5259	131.47	17.00	3628	90.69
18	50.79	7762	194.06	18.00	3410	85.26	18.00	7453	186.33	18.00	8105	202.62	18.00	5513	137.84	18.00	4018	100.45
19	53.71	7950	198.76	19.00	3759	93.98	19.00	7758	193.96	19.00	8261	206.52	19.00	5756	143.91	19.00	4237	105.92
20	56.64	8176	204.41	20.00	4161	104.03	20.00	7990	199.75	20.00	8357	208.92	20.00	6009	150.22	20.00	4547	113.67
21	59.64	8454	211.35	21.00	4600	114.99	21.00	8147	203.68	21.00	8624	215.60	21.00	6167	154.17	21.00	4705	117.63
22	62.67	8686	217.15	22.00	4925	123.13	22.00	8272	206.81	22.00	8764	219.11	22.00	6327	158.18	22.00	4907	122.67
23	65.54	8826	220.64	23.00	5190	129.76	23.00	8474	211.84	23.00	8977	224.43	23.00	6526	163.14	23.00	5016	125.41
24	68.45	8997	224.93	24.00	5625	140.63	24.00	8683	217.07	24.00	9159	228.99	24.00	6722	168.04	24.00	5126	128.15
25	71.53	9151	228.77	25.00	5854	146.35	25.00	8855	221.37	25.00	9264	231.61	25.00	6829	170.73	25.00	5388	134.70
26	74.58	9292	232.29	26.00	6021	150.51	26.00	9034	225.84	26.00	9525	238.13	26.00	6873	171.83	26.00	5670	141.76
27	77.53	9388	234.70	27.00	6142	153.55	27.00	9157	228.92	27.00	9665	241.62	27.00	6949	173.72	27.00	5894	147.36
28	80.42	9506	237.65	28.00	6234	155.85	28.00	9307	232.69	28.00	9754	243.85	28.00	7039	175.97	28.00	6059	151.48
29	83.33	9621	240.52	29.00	6394	159.84	29.00	9466	236.66	29.00	9972	249.29	29.00	7156	178.91	29.00	6173	154.32
30	86.26	9691	242.28	30.00	6596	164.91	30.00	9601	240.04	30.00	10115	252.88	30.00	7334	183.35	30.00	6345	158.62
32	89.19	9815	245.37	32.00	6944	173.61	32.00	9847	246.18	32.00	10381	259.52	32.00	7613	190.33	32.00	6574	164.34
34	92.07	9899	247.49	34.00	7123	178.07	34.00	10100	252.51	34.00	10614	265.36	34.00	7875	196.87	34.00	6729	168.22
36	94.97	10034	250.84	36.00	7307	182.67	36.00	10274	256.84	36.00	10804	270.11	36.00	8104	202.60	36.00	6838	170.94
38	97.91	10175	254.37	38.00	7465	186.64	38.00	10511	262.79	38.00	11063	276.58	38.00	8289	207.22	38.00	6915	172.87
40	100.84	10292	257.31	40.00	7602	190.04	40.00	10663	266.57	40.00	11219	280.47	40.00	8370	209.24	40.00	7075	176.88
45	103.77	10442	261.05	45.00	7922	198.04	45.00	11193	279.82	45.00	11701	292.52	45.00	8486	212.14	45.00	7590	189.75
50				50.00	8443	211.07	50.00	11558	288.95	50.00	12231	305.77	50.00	8835	220.86	50.00	7749	193.72
55				55.00	8974	224.34	55.00	11954	298.84	55.00	12537	313.42	55.00	9310	232.75	55.00	8297	207.44
60				60.00	9473	236.82	60.00	12297	307.43	60.00	13047	326.16	60.00	9838	245.96	60.00	8794	219.86
65				65.00	9903	247.57	65.00	12580	314.51	65.00	13334	333.36	65.00	10212	255.31	65.00	9162	229.04
70				70.00	10231	255.76	70.00	12984	324.61	70.00	13510	337.75	70.00	10494	262.34	70.00	9442	236.06
75				75.00	10428	260.71	75.00	13249	331.22	75.00	13630	340.75	75.00	10813	270.32	75.00	9612	240.29
80				80.00	10591	264.78	80.00	13452	336.31	80.00	13756	343.91	80.00	11039	275.97	80.00	9825	245.61
85				85.00	10880	272.01	85.00	13608	340.19	85.00	13952	348.80	85.00	11251	281.26	85.00	10083	252.09
90				90.00	11106	277.66	90.00	13749	343.73	90.00	14215	355.38	90.00	11403	285.08	90.00	10382	259.54
95				95.00	11316	282.90	95.00	13925	348.12	95.00	14325	358.14	95.00	11577	289.43	95.00	10600	264.99
100				100.00	11611	290.27	100.00	14208	355.19	100.00	14463	361.57	100.00	11775	294.37	100.00	10830	270.74

Table 9 Results for carbon in 2060-5 across scenarios
Cost gives $ per Total ton Carbon accumulated by this year
Quantity gives Total tons Carbon accumulated by this year in MMT
Note the costs vary from the price paid because these results
tell how much it costs for the earlier accumulation stages in Kyoto

Scenario	l-trn-noh			c-t-noh			c-h-50yr			c-trn			c-h-bsldt			c-h-noldt		
Seq Pay	payland			paycarb			paycarb			paycarb			paycarb			paycarb		
Harvest	NEVER			NEVER			50yrs			anytime			anytime			anytime		
Land Tran	free			free			free			free			noextra			none		
Price Paid for 2040 Carb	Cost	Cumul. Quantity	Annual Quantity	Cost	Cumul. Quantity	Annual Quantity	Cost	Cumul. Quantity	Annual Quantity	Cost	Cumul. Quantity	Annual Quantity	Cost	Cumul. Quantity	Annual Quantity	Cost	Cumul. Quantity	Annual Quantity
2	0.00	65	1.08				0.00	100	1.67	15.02	128	2.13	13.84	112	1.87	0.00	58	0.96
3	6.29	1265	21.08				7.18	474	7.90	17.42	276	4.61	19.28	166	2.77	20.35	70	1.16
4	8.61	2515	41.91				8.46	865	14.42	19.59	544	9.07	28.05	239	3.98	16.98	166	2.76
5	11.15	3348	55.79				10.92	1092	18.21	23.75	699	11.65	30.73	311	5.19	21.49	190	3.17
6	13.60	3915	65.25	3.82	325	5.42	10.09	1721	28.69	27.66	823	13.72	34.00	407	6.79	26.28	213	3.55
7	15.12	5168	86.14	4.62	463	7.72	9.78	2423	40.38	28.75	1050	17.50	37.87	450	7.51	32.44	233	3.89
8	16.43	6289	104.82	5.58	872	14.53	10.02	3081	51.34	25.90	1458	24.30	43.80	456	7.60	32.30	296	4.93
9	17.94	7266	121.10	6.33	1217	20.28	10.99	3561	59.35	24.04	1933	32.21	46.03	526	8.77	36.34	353	5.88
10	19.66	8105	135.09	7.10	1484	24.73	11.79	4063	67.71	24.60	2251	37.52	48.51	634	10.56	42.10	393	6.55
11	21.50	8555	142.58	7.80	2046	34.10	12.84	4458	74.30	23.41	2772	46.19	49.90	743	12.39	48.26	441	7.35
12	23.30	9164	152.74	8.41	2353	39.22	13.57	5172	86.20	24.71	3021	50.35	55.09	813	13.55	56.08	453	7.56
13	25.14	9780	163.00	9.12	2572	42.87	14.84	5426	90.44	27.36	3212	53.54	59.90	897	14.96	62.23	512	8.54
14	27.09	10127	168.78	9.83	2972	49.54	16.26	5600	93.34	30.46	3268	54.47	50.50	1224	20.40	67.53	577	9.61
15	29.03	10369	172.82	10.51	3250	54.17	17.57	5856	97.60	33.30	3335	55.59	54.49	1274	21.24	71.40	657	10.95
16	30.96	10585	176.42	11.18	3728	62.14	18.78	5967	99.45	33.19	3700	61.66	59.81	1340	22.33	72.43	737	12.28
17	32.92	10850	180.84	11.76	4463	74.39	19.78	6201	103.36	33.70	3969	66.15	63.96	1398	23.30	73.90	835	13.91
18	34.93	11288	188.14	12.38	4959	82.65	20.78	6456	107.60	34.52	4227	70.44	67.27	1475	24.59	73.58	983	16.38
19	36.92	11567	192.78	13.04	5476	91.27	21.67	6802	113.37	35.42	4432	73.86	72.37	1511	25.19	78.88	1021	17.01
20	38.91	11903	198.38	13.67	6089	101.49	22.79	7012	116.87	36.59	4568	76.13	75.87	1584	26.40	79.55	1143	19.05
21	40.92	12322	205.37	14.32	6747	112.45	24.19	7074	117.90	37.45	4836	80.60	74.17	1746	29.10	79.72	1239	20.66
22	42.94	12677	211.29	14.98	7233	120.54	25.05	7266	121.10	39.49	4883	81.38	71.13	1957	32.62	80.23	1345	22.42
23	44.92	12877	214.62	15.68	7614	126.90	25.89	7527	125.45	42.12	4902	81.70	67.49	2224	37.07	83.25	1386	23.10
24	46.92	13126	218.77	16.40	8234	137.24	26.68	7809	130.16	44.22	4971	82.85	63.64	2535	42.24	85.62	1437	23.95
25	49.01	13356	222.60	17.09	8562	142.69	28.05	7891	131.52	46.16	5017	83.62	63.84	2674	44.57	89.77	1501	25.01
26	51.10	13562	226.03	17.78	8803	146.72	28.99	8101	135.01	48.33	5124	85.40	65.39	2733	45.55	94.46	1561	26.01
27	53.14	13697	228.28	18.49	8969	149.49	29.93	8261	137.68	50.27	5191	86.51	66.59	2818	46.96	97.96	1625	27.08
28	55.13	13865	231.09	19.18	9100	151.66	30.72	8484	141.40	52.38	5215	86.91	68.54	2875	47.92	96.26	1763	29.38
29	57.13	14034	233.91	19.88	9329	155.48	31.48	8721	145.35	54.52	5304	88.40	69.99	2965	49.42	93.69	1911	31.85
30	59.13	14139	235.65	20.55	9629	160.48	32.34	8906	148.43	56.94	5329	88.82	68.97	3190	53.17	92.06	2068	34.46
32	61.13	14321	238.69	22.03	10086	168.11	33.98	9272	154.54	61.67	5386	89.77	68.10	3577	59.62	88.17	2386	39.76
34	63.11	14441	240.68	23.46	10322	172.03	35.69	9623	160.38	66.73	5408	90.13	67.75	3952	65.86	88.86	2575	42.91
36	65.12	14633	243.88	24.90	10564	176.07	37.80	9784	163.06	71.88	5411	90.19	68.64	4250	70.84	93.21	2641	44.01
38	67.13	14841	247.34	26.33	10775	179.58	40.14	9951	165.85	76.14	5522	92.03	68.96	4568	76.13	95.32	2757	45.94
40	69.15	15008	250.13	27.73	10964	182.73	42.35	10070	167.83	79.86	5619	93.65	71.60	4676	77.93	95.22	2972	49.54
45	71.19	15222	253.69	31.26	11402	190.03	47.42	10622	177.03	88.90	5923	98.71	79.87	4781	79.68	93.50	3653	60.88
50				34.81	12128	202.13	51.96	11123	185.38	102.37	5974	99.56	86.44	5111	85.18	99.80	3882	64.70
55				38.29	12889	214.82	57.06	11523	192.05	112.09	6151	102.52	91.79	5578	92.97	104.18	4380	73.01
60				41.78	13603	226.71	63.43	11633	193.88	125.45	6240	104.00	92.68	6369	106.15	106.46	4956	82.60
65				45.27	14217	236.95	69.26	11806	196.77	136.68	6341	105.69	101.15	6563	109.38	105.86	5625	93.75
70				48.77	14685	244.76	76.51	11879	197.99	144.89	6527	108.78	109.79	6691	111.51	112.51	5875	97.91
75				52.25	14968	249.46	83.27	11933	198.88	152.71	6694	111.57	119.54	6784	113.07	121.58	5929	98.82
80				55.75	15198	253.30	89.76	11989	199.82	160.27	6866	114.44	123.95	7125	118.75	137.28	5725	95.42
85				59.24	15611	260.18	95.94	12056	200.94	171.04	6934	115.56	128.74	7428	123.80	148.94	5755	95.91
90				62.74	15933	265.54	102.07	12124	202.06	175.90	7273	121.22	133.94	7662	127.70	151.84	6153	102.56
95				66.23	16233	270.55	108.75	12164	202.73	184.03	7395	123.25	143.24	7678	127.97	155.30	6484	108.07
100				69.73	16651	277.52	116.59	12186	203.09	194.89	7421	123.69	149.00	7903	131.71	158.99	6812	113.53

Figure 1 : Supply curve for cumulative amount of carbon sequestered by the program in year 2010. Runs are done under alternative payment basis, harvest allowed and land transfer assumptions. While carbon is paid for targeting amount of carbon on hand in 2040, the price here is derived by taking program cost divided by the carbon realized 10 years after the program begins. The cost of carbon sequestered that soon is substantially more expensive than carbon in later years. The legend for the labels appears in table 4.

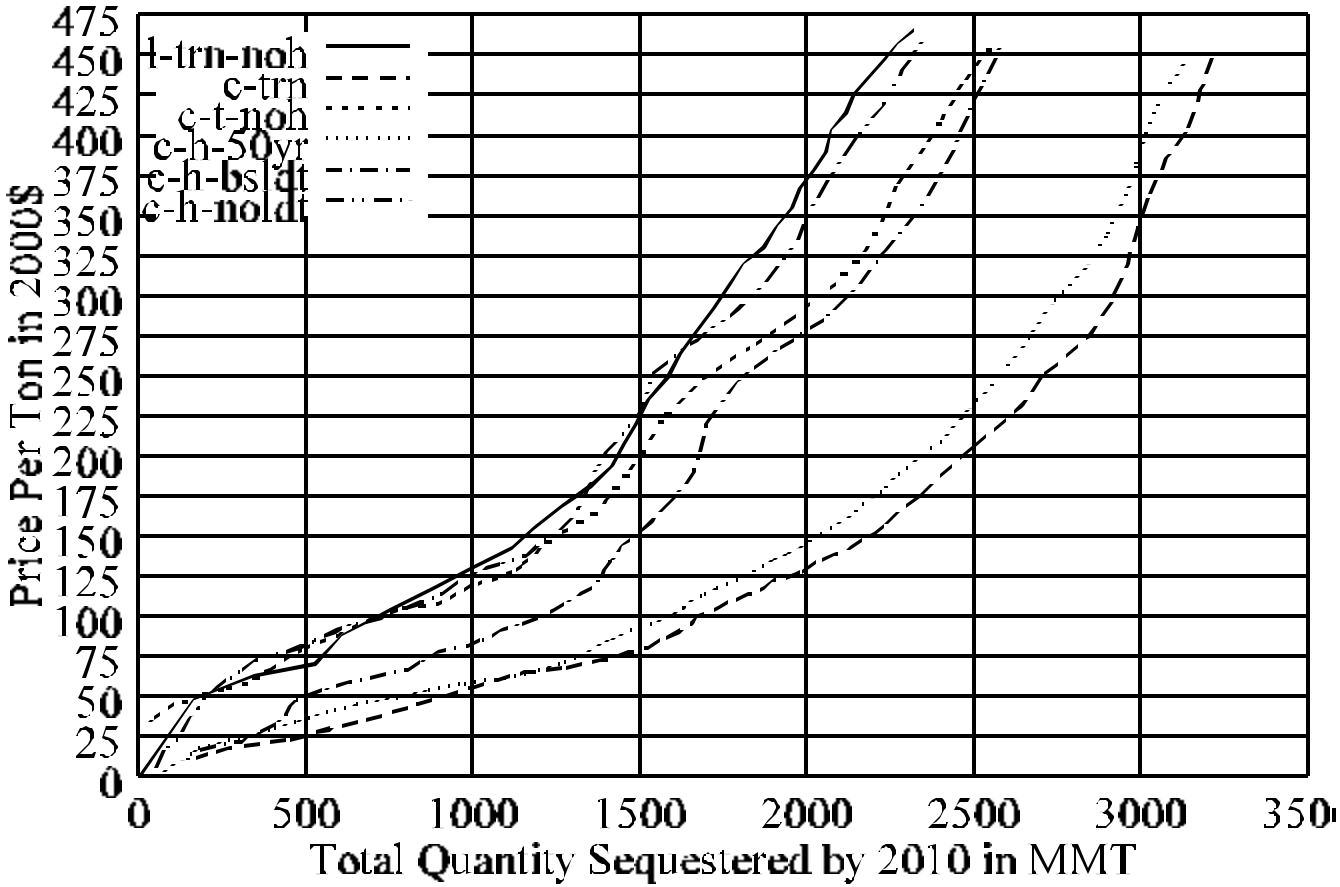


Figure 2 : Supply curve for cumulative amount of carbon sequestered by the program in year 2020. Runs are done under alternative payment basis, harvest allowed and land transfer assumptions. While carbon is paid for targeting amount of carbon on hand in 2040, the price here is derived by taking program cost divided here by the carbon realized 20 years after the program begins. The cost of carbon sequestered that soon is substantially more expensive than carbon in later years, but is less expensive and than that realized at after 10 years. The legend for the labels appears in table 4.

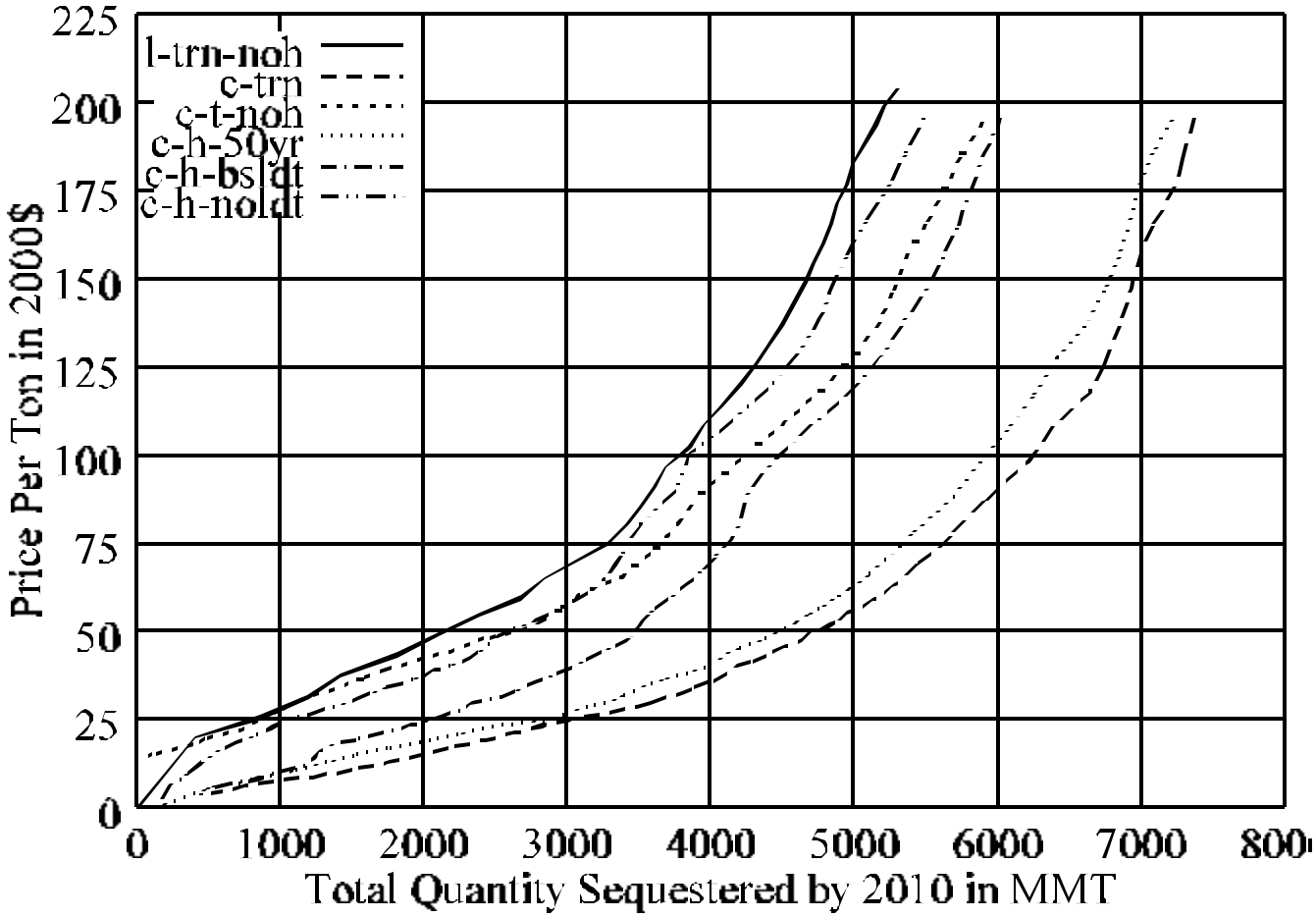


Figure 3 : Supply curve for cumulative amount of carbon sequestered by the program in year 2030. Runs are done under alternative payment basis, harvest allowed and land transfer assumptions. While carbon is paid for targeting amount of carbon on hand in 2040, the price here is derived by taking program cost divided here by the carbon realized 30 years after the program begins. The legend for the labels appears in table 4.

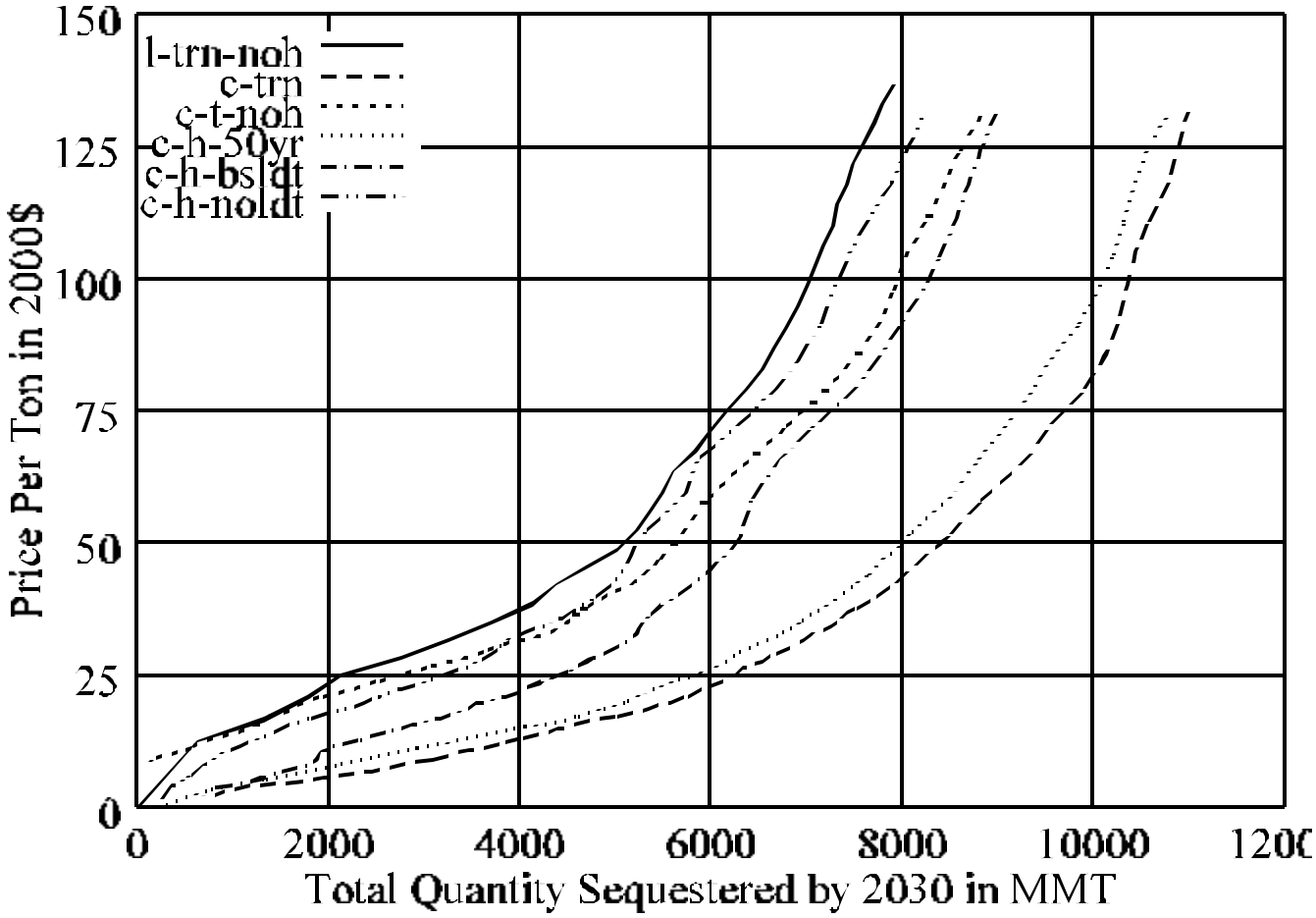


Figure 4 : Supply curve for cumulative amount of carbon sequestered by the program in year 2040 -- the target year. Runs are done under alternative payment basis, harvest allowed and land transfer assumptions. The price here is derived by taking program cost divided here by the carbon realized 40 years after the program begins. The legend for the labels appears in table 4.

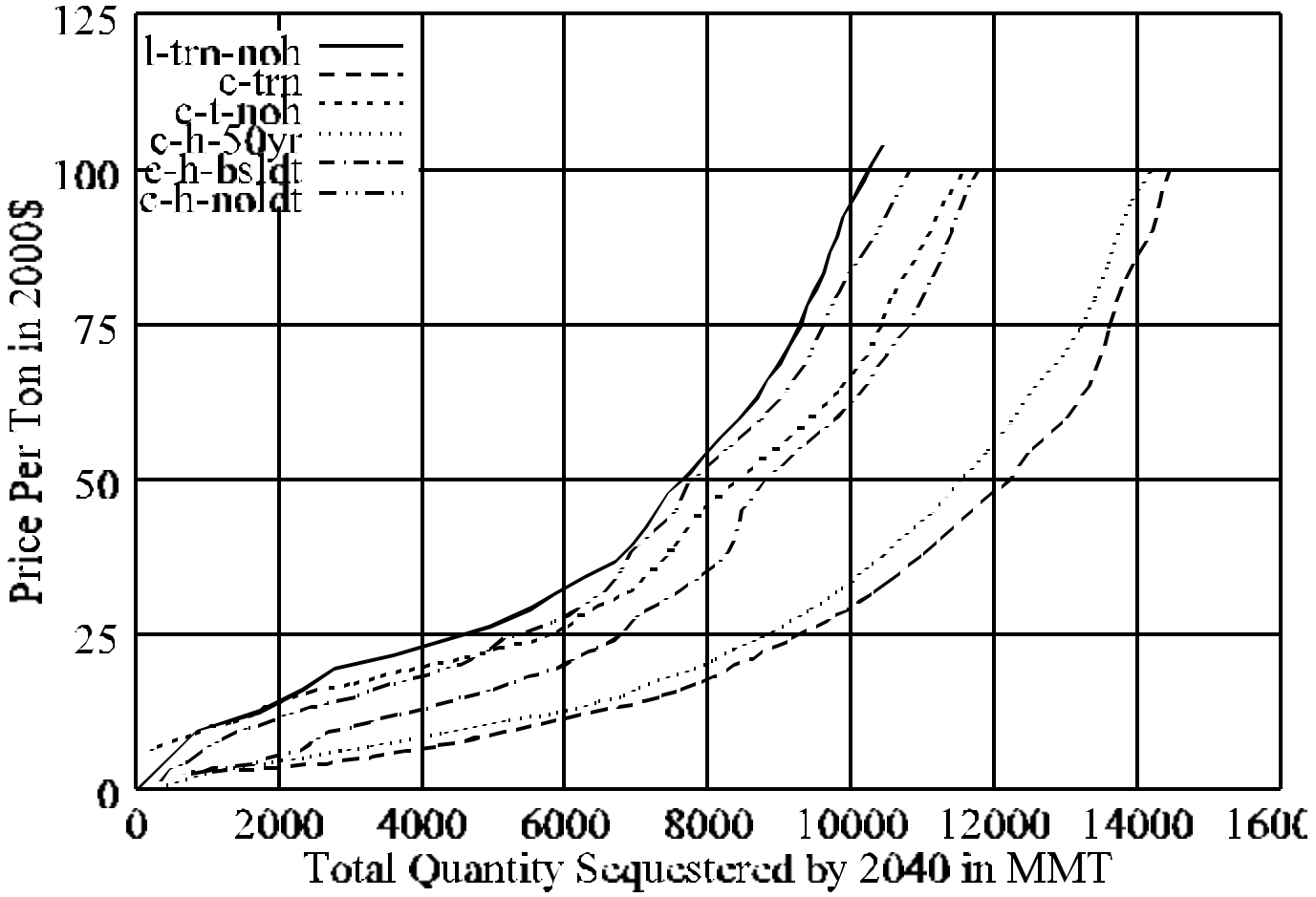


Figure 5 Evidence pertinent to carbon longevity drawn from scenarios where $30 is paid on a carbon potential basis. The scenarios included legend identifies the scenarios as detailed in table 4. The base scenario is also included. The data give the total carbon accumulated by a particular time. The carbon accounting considers carbon from all forest and agricultural sources including newly sequestered forest enrolled in the program, traditional forest sector carbon and agricultural soul carbon. All data are in million metric tons

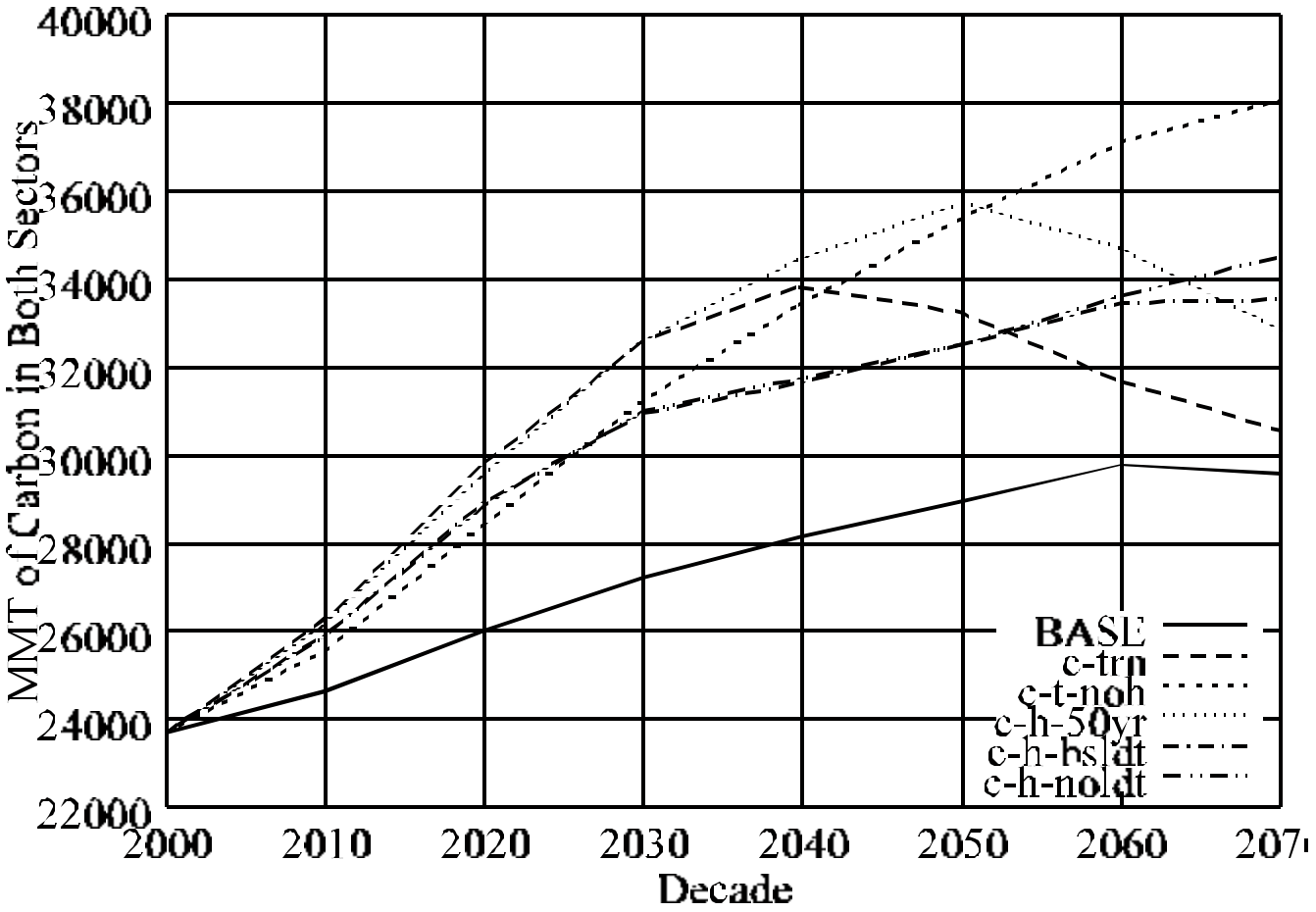


Figure 6 Land movements for carbon sequestration by region at alternative offer prices from the carbon payment based no harvest allowed scenario. The individual lines show carbon sequestration in enrollments in the FASOM regions where nonzero enrollments occur. Some enrollment levels are small or zero because of limited availability of suitable agricultural land which could be forested. All data are in thousands of acres

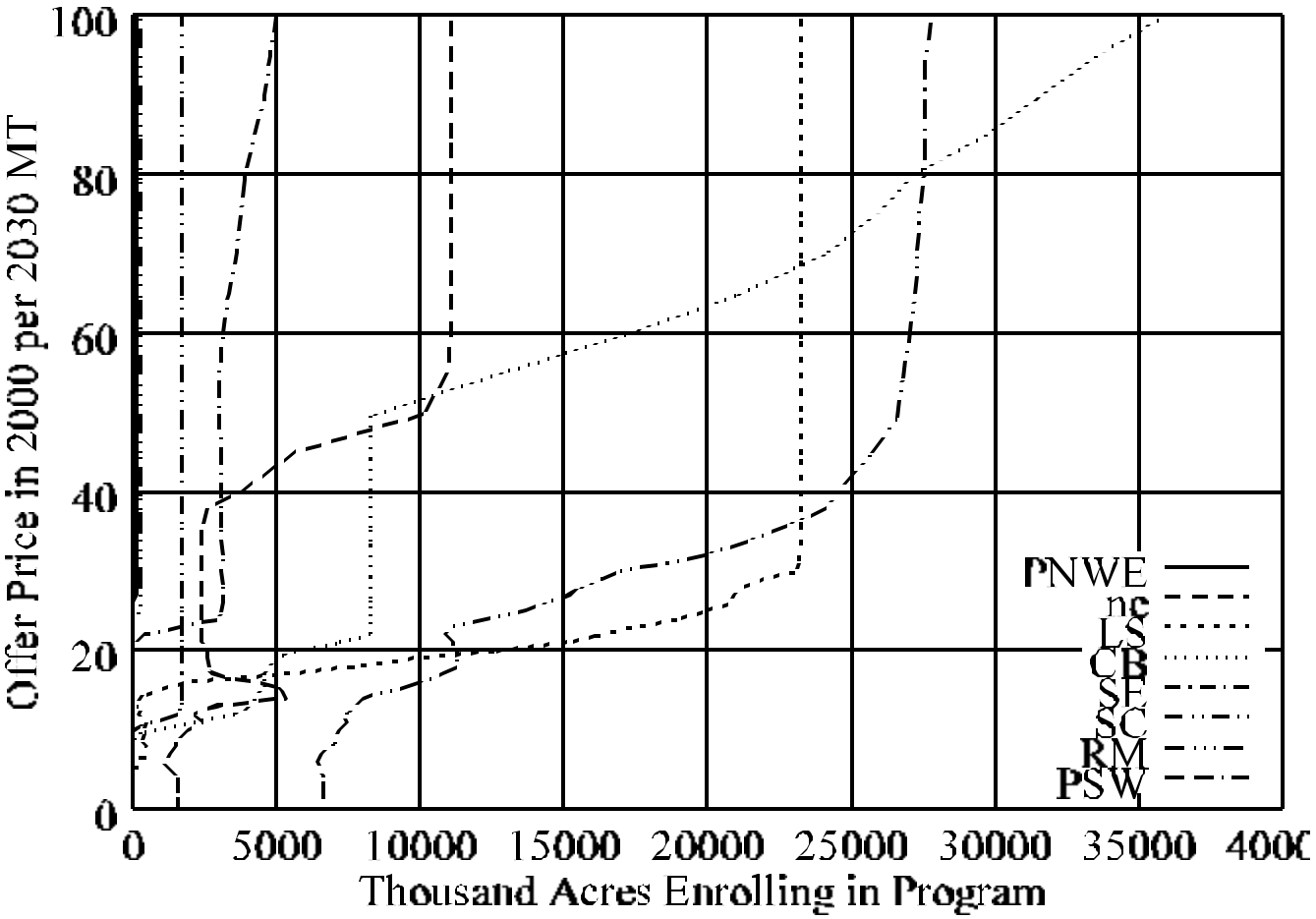
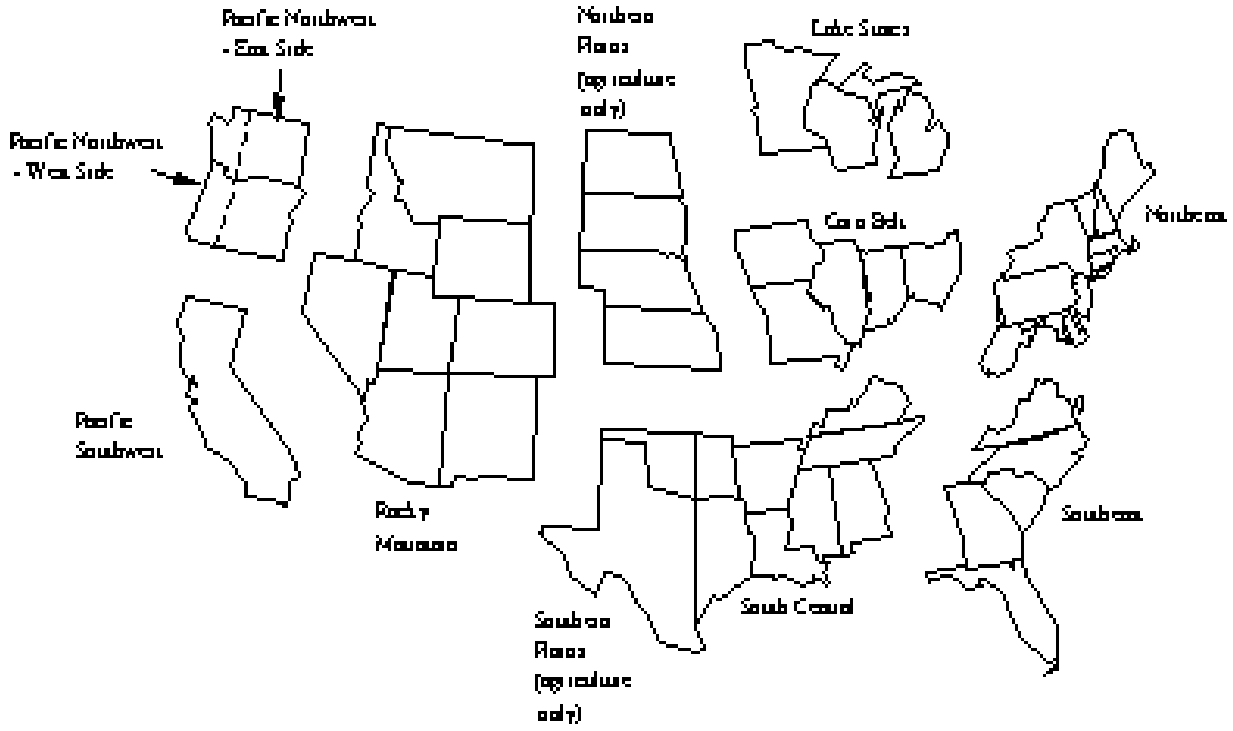


Figure 7 Regions included in FASOM



References

Adams, D., R. Alig, J.M. Callaway, B.A. McCarl, and S. Winnett. *The Forest and Agricultural Sector Optimization Model (FASOM): Model Structure and Policy Applications*. USDA Forest Service Research Paper PNW-495. Pacific Northwest Research Station, Portland, Oregon. 1996.

Adams, D., R. Alig and B.A. McCarl. "An Analysis of the Impacts of Public Timber Harvest Policies on Private Forest Management in the U.S." *Forest Science* 42(1996): 343-358.

Adams, R., D. Adams, J. Callaway, C. Chang, and B. McCarl. Sequestering carbon on agricultural land: Social costs and impacts on timber markets. *Contemporary Policy Issues* XI(1993): 76-87.

Adams, R., J.M. Callaway, C. Chang, and B.A. McCarl. 1992. "The Role of Agriculture in Climate Change: A Preliminary Evaluation." In J. Reilly, ed. Global Change: Agriculture. Forestry and Natural Resources. Westview Press, Boulder, CO. pp. 273-287.

Birdsey, R. 1992b. Prospective Changes in Forest Carbon Storage from Increasing Forest Area and Timber Growth. USDA Forest Service Technical Publication, Washington, D.C.

Callaway, J.M. Private communication, Boulder Colorado, 1996.

Chang, C., B.A. McCarl, J. Mjelde, and J. Richardson. "Sectoral Implications of Farm Program Modifications." *American Journal of Agricultural Economics*. 74(1992):38-49.

McCarl, B.A., C.C. Chang, J.D. Atwood, and W.I. Nayda. *Documentation of ASM: The U.S. Agricultural Sector Model*. Unpublished Paper. Department of Agricultural Economics, Texas A&M University, 1994.

Appendix: Full results of the study

The model used in this study generated many more quantitative results than are feasible to discuss in the text or even fully present in a set of tables. In this appendix we table a number of the backup results. The appendix is organized with tables for each of the major scenarios. There are six major series of tables. The scenarios by major Table series are described below and also of in table 5.

Scenario	Major Table Series	Description
l-trn-noh	1	Results from scenario runs with the sequestration payments based on enrolled acres, with harvesting prohibited and forestry to agriculture land transfers unrestricted.
c-t-noh	2	Results from scenario runs with the sequestration payments based on potential carbon in 2040, with harvesting prohibited and forestry to agriculture land transfers unrestricted.
c-h-50yr	3	Results from scenario runs with the sequestration payments based on potential carbon in 2040, with harvesting allowed after 50 years and forestry to agriculture land transfers unrestricted.
c-trn	4	Results from scenario runs with the sequestration payments based on potential carbon in 2040 with harvesting fully allowed and forestry to agriculture land transfers unrestricted.
c-h-bsldt	5	Results from scenario runs with the sequestration payments based on potential carbon in 2040 with harvesting fully allowed and forestry to agriculture land transfers restricted to the levels allowed the base model (i.e. newly sequestered acres are not allowed to transfer back).
c-h-noldt	6	Results from scenario runs with the sequestration payments based on potential carbon in 2040 with harvesting fully allowed and forestry to agriculture land transfers prohibited

Under each major series there are groups table groups a, b, and c.

Group A Appendix Tables Description – Raw Results

The first of the tables in each major table series is the group a table. These are labeled appendix table 1a, 2a, 3a etc. The group a tables give raw results on a number of output items. The raw items contained in

those tables are defined below.

Tabled Item	Units	Brief Description
price	$/MT or $/Acre	Price paid for carbon or land in $ per acre or $/MT depending on the payment basis for the scenario
+40carbpay	$/MT	Specified or calculated price per metric ton of carbon in the year in which the productivity targets were established
landpay	1000 acres	Acres enrolled in sequestration program
carbon+10	MMT (million metric tons)	Total carbon sequestered in 10 years on enrolled acres
carbon+20	MMT	Total carbon sequestered in 20 years on enrolled acres
carbon+30	MMT	Total carbon sequestered in 30 years on enrolled acres
carbon+40	MMT	Total carbon sequestered in 40 years on enrolled acres
carbon+50	MMT	Total carbon sequestered in 50 years on enrolled acres
carbon+60	MMT	Total carbon sequestered in 60 years on enrolled acres
carbon+70	MMT	Total carbon sequestered in 70 years on enrolled acres
netcrb+10	MMT	Net carbon sequestered over the base case carbon inventory10 years after program beginning (MMT)
netcrb+20	MMT	Net carbon sequestered over the base case carbon inventory20 years after program beginning (MMT)
netcrb+30	MMT	Net carbon sequestered over the base case carbon inventory30 years after program beginning (MMT)
netcrb+40	MMT	Net carbon sequestered over the base case carbon inventory40 years after program beginning (MMT)
netcrb+50	MMT	Net carbon sequestered over the base case carbon inventory50 years after program beginning (MMT)
netcrb+60	MMT	Net carbon sequestered over the base case carbon inventory60 years after program beginning (MMT)
netcrb+70	MMT	Net carbon sequestered over the base case carbon inventory70 years after program beginning (MMT)
progcost	billion 2000$	Total program cost

cost/acre	2000$ /Acre	Average Program cost per acre enrolled
avgmicexi	Index ranging from 1-4	Index of management intensity on forested acres not enrolled in the sequestration program. This index ranges from 1 to 4 with 1 being extremely low management and 4 being high management
avgmicseq	Index ranging from 1-4	Index of management intensity on acres enrolled in the sequestration program. This index ranges from 1 to 4 with 1 being extremely low management and 4 being high management
avgrotagex	years	National average rotation age on forested acres not enrolled in sequestration program.
avgrotagsq	years	National average rotation age on forested acres enrolled in sequestration program
ldinnow	1000 acres	Acres transferring from agricultural land uses to forest in the first decade. This includes acres enrolling in the sequestration program and acres transferring for other reasons.
ldin10-20	1000 acres	Acres transferring from agricultural land uses to forest in the decades from years 10 through 20. This does not includes acres enrolling in the sequestration program as enrollment in that program can only occur in the first-year.
ldin30+	1000 acres	Acres transferring from agricultural land uses to forest in the decades from years 30 onward.
ldoutnow	1000 acres	Acres transferring from forestry land uses to agriculture in the first decade.
ldout10-20	1000 acres	Acres transferring from forestry land uses to agriculture in the decades from years 10 to 20.
ldout30+	1000 acres	Acres transferring from forestry land uses to agriculture in the decades from years 30 onward

For each major series the group a tables contains data on between 30 and 50 alternative price payment scenarios. Not all of these results could be placed across the page, so we subdivide the table up into four price series. Thus, for a table series under group a we have conceivably a table for each of price series 1-4. The first of those tables contains results pertinent to the first twelve price scenarios. The first row of in table gives the price assumption associated with each column in table. Referencing Appendix Table 1a the price varies

from $250 through $3000 (per acre since this is a land payment based scenario). This is the payment per acre which is assumed to be made in year 2000 dollars as one time payment. The table structure is similar for the other major series with the exception at the prices in those tables are price per potential metric ton of carbon as a onetime payment in year 2000 dollars.

Group B Appendix Tables Description – Cost per Ton Carbon Results

There are also group b tables presented for each major scenario series. These tables give cost per ton of carbon for carbon generated by the sequestration program. This cost is calculated on a number of different bases and is total program cost divided by the amount of carbon realized by a particular point in time under a particular definition of carbon.

a) Two major definitions of carbon are uses – total carbon and net carbon.

Total carbon refers to the carbon grown the acres formally enrolled in the sequestration program during their first rotation in the forest sector

Net carbon is the gain under this scenario vs. the base, no sequestration program, case. These results should probably be disregarded for the first few time periods as they are distorted by the acceleration of land transfers. In particular, if one looks at appendix table 1a note in the base scenario there are 20 million acres transferring in the first to decades but that as the carbon sequestration program payments rise sufficiently high the land transfers in later decades (where the payment program is not active) fall to zero.

b) The various timing definitions for the carbon quantity used as the divisor span from the model computed carbon 10 years out to 70 years out. What was done in particular is to calculate program cost divided by the amount of carbon realized at these alternative timing intervals using the to definitions for carbon total and net. Numbers relevant to Kyoto Accord compliance

would involve carbon 10 and 20 years after to the program began. The per ton carbon payments under the carbon potential based payment program used the carbon number calculated for 40 years out.

Group c Appendix Tables Description – Regional Enrollment Results

The third group of tables included under each of the major scenario series is the group c tables. These tables give regional movements of land in thousands of acres into the sequestration program. The regional movements observed in the tables are function of the capability of land move into forestry from both pasture and cropland uses, the capability of agricultural lands in pasture usages to be upgraded into a cropland usage and the price of carbon offered. The tables give different amounts of land being transferred for each different price that is being offered under the scenario. Again the price definitions vary from being prices per acre of land enrolled to prices offered per acre carbon realized by 2040 depending on the carbon payment basis relevant to the scenario. Abbreviations are used in these tables to identify the regions within which land movement occurs. The abbreviations are as follows

Abbreviation	Expanded Region Description (see map main text)
PNWW	Pacific Northwest West of the Cascades
PNWE	Pacific Northwest east of the Cascades
NE	Northeast
LS	Lake States
CB	Corn Belt
SE	South East
SC	South Central
GP	Great Plains
SW	Southwest
RM	Rocky Mountains

PSW	Pacific Southwest

Appendix Table 1a Results for l-trn-noh scenario

Basis for land transfer	Payments made for sequestered land based acres enrolled
Harvesting Assumption	Harvest can never occur on sequestered land
Land Transfer to Ag Assumption	Land transfers can freely occur

Raw Results for Price set 1 for l-trn-noh

	Price in $ per Acre moving into forest in 2000-2005											
price	250.00	500.00	750.00	1000.00	1250.00	1500.00	1750.00	2000.00	2250.00	2500.00	2750.00	3000.00
+40carbpay	0	41	860	1751	2346	2769	3617	4331	4967	5544	5859	6277
landpay	0	472	10608	21659	29871	35501	44642	51652	57933	63736	66888	71172
carbon+10	0	7	168	348	534	607	756	883	1002	1120	1185	1270
carbon+20	0	17	411	864	1200	1422	1813	2113	2395	2687	2851	3061
carbon+30	0	29	642	1331	1801	2136	2762	3261	3716	4152	4393	4708
carbon+40	0	41	860	1751	2346	2769	3617	4331	4967	5544	5859	6277
carbon+50	0	54	1078	2167	2887	3394	4467	5396	6214	6931	7317	7836
carbon+60	0	65	1265	2515	3348	3915	5168	6289	7266	8105	8555	9164
carbon+70	0	73	1395	2752	3670	4267	5660	6949	8061	8990	9483	10164
netcrb+10	0	1	70	219	352	377	445	574	684	791	856	932
netcrb+20	0	4	207	442	670	819	1062	1370	1660	1944	2107	2305
netcrb+30	0	26	407	813	1152	1432	1916	2377	2819	3252	3491	3800
netcrb+40	0	52	570	1100	1508	1881	2581	3176	3732	4307	4618	5030
netcrb+50	0	62	660	1185	1696	2146	3020	3774	4453	5167	5552	6063
netcrb+60	0	42	568	1103	1761	2277	3348	4268	5088	5921	6364	6962
netcrb+70	0	42	635	1173	1895	2449	3775	4953	6034	6951	7422	8087
progcost	0	0	8	22	37	53	78	103	130	159	184	214
cost/acre	0	500	750	1000	1250	1500	1750	2000	2250	2500	2750	3000
avgmicexi	2.42	2.42	2.44	2.47	2.47	2.47	2.47	2.48	2.49	2.49	2.49	2.49
avgmicseq	0.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
avgrotagex	43.11	43.15	41.83	41.89	41.54	41.37	40.99	40.95	41.17	41.17	41.16	41.15
avgrotagsq	0.00	47.55	47.37	50.88	53.25	50.12	48.16	47.49	46.86	46.31	46.03	46.34
ldinnow	9946	10039	17150	23980	32077	37543	44642	51652	57933	63736	66888	71172
ldin10-20	6403	6474	6430	5972	5841	5702	6381	2990	0	0	0	0
ldin30+	3176	2722	0	0	0	0	0	0	0	0	0	0
ldoutnow	6543	6615	8554	8552	10336	12009	13365	13971	14466	14743	14743	14983
ldout10-20	10653	10280	10482	11781	11484	9974	8831	8241	7745	7470	7490	7250
ldout30+	24415	24457	21383	15462	13728	13262	11685	8279	5290	5288	5281	5280

Appendix Table 1a Results for l-trn-noh scenario(continued)

Raw Results for Price set 2 for l-trn-noh

	Price in $ per Acre moving into forest in 2000-2005											
price	3250.00	3500.00	3750.00	4000.00	4250.00	4500.00	4750.00	5000.00	5250.00	5500.00	5750.00	6000.00
+40carbpay	6705	6953	7131	7288	7466	7762	7950	8176	8454	8686	8826	8997
landpay	75659	78389	80258	81925	84056	87618	89895	92617	96040	98981	100602	102645
carbon+10	1360	1416	1456	1490	1526	1587	1625	1670	1725	1770	1813	1871
carbon+20	3281	3416	3518	3606	3699	3854	3953	4071	4213	4329	4408	4504
carbon+30	5034	5228	5371	5495	5630	5857	6000	6172	6382	6555	6664	6798
carbon+40	6705	6953	7131	7288	7466	7762	7950	8176	8454	8686	8826	8997
carbon+50	8362	8661	8873	9060	9281	9648	9880	10160	10507	10799	10969	11179
carbon+60	9780	10127	10369	10585	10850	11288	11567	11903	12322	12677	12877	13126
carbon+70	10852	11239	11502	11735	12037	12533	12849	13230	13710	14120	14347	14634
netcrb+10	1011	1066	1103	1138	1170	1231	1268	1314	1369	1414	1456	1514
netcrb+20	2520	2655	2748	2840	2930	3088	3182	3302	3442	3557	3635	3732
netcrb+30	4119	4313	4450	4571	4703	4923	5068	5242	5454	5627	5736	5869
netcrb+40	5449	5697	5876	6024	6200	6482	6675	6900	7183	7416	7555	7727
netcrb+50	6583	6883	7087	7263	7481	7828	8066	8335	8682	8972	9141	9351
netcrb+60	7562	7906	8119	8335	8583	9014	9289	9636	10053	10407	10607	10856
netcrb+70	8760	9143	9340	9580	9852	10352	10659	11051	11529	11939	12166	12453
progcost	246	274	301	328	357	394	427	463	504	544	578	616
cost/acre	3250	3500	3750	4000	4250	4500	4750	5000	5250	5500	5750	6000
avgmicexi	2.48	2.48	2.49	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48
avgmicseq	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
avgrotagex	41.13	41.12	41.16	41.08	41.12	41.01	41.08	41.02	41.03	41.02	41.02	41.02
avgrotagsq	46.94	47.70	47.87	47.88	48.06	47.79	47.78	47.69	47.58	47.58	47.89	48.43
ldinnow	75659	78389	80258	81925	84056	87617	89895	92617	96040	98981	100602	102645
ldin10-20	0	0	0	0	0	0	0	0	0	0	0	0
ldin30+	0	0	0	0	0	0	0	0	0	0	0	0
ldoutnow	15279	15321	15321	15321	15418	15418	15466	15466	15480	15481	15481	15481
ldout10-20	6964	6925	6925	6925	6841	6902	6854	6854	6840	6838	6838	6838
ldout30+	5276	5273	5278	5278	5265	5205	5205	5205	5175	5175	5174	5174

Appendix Table 1a Results for l-trn-noh scenario(continued)

Raw Results for Price set 3 for l-trn-noh

	Price in $ per Acre moving into forest in 2000-2005											
price	6250.00	6500.00	6750.00	7000.00	7250.00	7500.00	7750.00	8000.00	8250.00	8500.00	8750.00	9000.00
+40carbpay	9151	9292	9388	9506	9621	9691	9815	9899	10034	10175	10292	10442
landpay	104729	106616	107830	109207	110583	111464	112957	113928	115501	117204	118608	120397
carbon+10	1912	1954	1981	2022	2056	2075	2117	2142	2187	2232	2273	2325
carbon+20	4584	4660	4714	4782	4844	4882	4950	4998	5074	5151	5218	5304
carbon+30	6914	7022	7097	7190	7278	7332	7427	7494	7599	7708	7800	7917
carbon+40	9151	9292	9388	9506	9621	9691	9815	9899	10034	10175	10292	10442
carbon+50	11370	11544	11660	11804	11945	12032	12185	12287	12449	12623	12766	12948
carbon+60	13356	13562	13697	13865	14034	14139	14321	14441	14633	14841	15008	15222
carbon+70	14898	15135	15284	15477	15672	15793	16005	16140	16359	16600	16791	17036
netcrb+10	1555	1598	1624	1665	1699	1718	1760	1785	1830	1875	1914	1967
netcrb+20	3812	3888	3942	4009	4072	4109	4177	4225	4301	4378	4448	4533
netcrb+30	5985	6093	6168	6261	6349	6402	6497	6564	6669	6777	6865	6982
netcrb+40	7881	8021	8117	8235	8349	8419	8543	8628	8762	8903	9014	9163
netcrb+50	9543	9724	9840	9984	10125	10210	10370	10472	10635	10807	10947	11129
netcrb+60	11086	11298	11433	11603	11772	11878	12068	12188	12379	12585	12748	12962
netcrb+70	12717	12955	13105	13299	13494	13617	13830	13966	14185	14426	14605	14849
progcost	655	693	728	764	802	836	875	911	953	996	1038	1084
cost/acre	6250	6500	6750	7000	7250	7500	7750	8000	8250	8500	8750	9000
avgmicexi	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48
avgmicseq	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
avgrotagex	41.02	41.01	41.00	41.00	41.00	40.99	41.00	41.00	41.00	41.00	40.96	40.96
avgrotagsq	48.75	49.06	49.16	49.50	49.72	49.81	50.22	50.30	50.61	50.91	51.21	51.59
ldinnow	104729	106616	107830	109207	110583	111464	112957	113928	115501	117204	118608	120397
ldin10-20	0	0	0	0	0	0	0	0	0	0	0	0
ldin30+	0	0	0	0	0	0	0	0	0	0	0	0
ldoutnow	15481	15481	15481	15481	15481	15481	15481	15489	15492	15494	15494	15494
ldout10-20	6838	6838	6838	6838	6838	6838	6838	6830	6827	6829	6868	6868
ldout30+	5174	5174	5062	5062	5144	5144	5144	5144	5144	5141	5101	5101

Appendix Table 1b Cost per ton carbon Results
There are many different bases on which this can be computed
Here we compute all almost all of them on a time period by time period basis

Results for Price set 1 for l-trn-noh

	Price in $ per Acre moving into forest in 2000-2005											
	250.00	500.00	750.00	1000.00	1250.00	1500.00	1750.00	2000.00	2250.00	2500.00	2750.00	3000.00
carbon+10		0.00	47.36	62.25	69.94	87.71	103.39	116.96	130.15	142.31	155.23	168.07
carbon+20		0.00	19.33	25.07	31.13	37.45	43.09	48.90	54.42	59.31	64.52	69.76
carbon+30		0.00	12.38	16.28	20.73	24.93	28.29	31.68	35.08	38.38	41.87	45.35
carbon+40		0.00	9.25	12.37	15.92	19.23	21.60	23.85	26.24	28.74	31.40	34.01
carbon+50		0.00	7.38	10.00	12.93	15.69	17.49	19.14	20.98	22.99	25.14	27.25
carbon+60		0.00	6.29	8.61	11.15	13.60	15.12	16.43	17.94	19.66	21.50	23.30
carbon+70		0.00	5.70	7.87	10.17	12.48	13.80	14.87	16.17	17.72	19.40	21.01
netcrb+10		0.00	113.70	99.12	106.12	141.37	175.51	179.91	190.65	201.37	214.77	229.10
netcrb+20		0.00	38.48	49.04	55.71	65.03	73.55	75.42	78.55	81.95	87.30	92.62
netcrb+30		0.00	19.56	26.65	32.41	37.18	40.78	43.46	46.25	48.99	52.69	56.19
netcrb+40		0.00	13.95	19.68	24.77	28.32	30.26	32.52	34.93	36.99	39.83	42.45
netcrb+50		0.00	12.05	18.28	22.02	24.81	25.87	27.37	29.27	30.84	33.13	35.21
netcrb+60		0.00	14.02	19.64	21.21	23.38	23.33	24.20	25.62	26.91	28.91	30.67
netcrb+70		0.00	12.52	18.46	19.70	21.74	20.70	20.86	21.60	22.92	24.78	26.40

Results for Price set 2 for l-trn-noh

	Price in $ per Acre moving into forest in 2000-2005											
	3250.00	3500.00	3750.00	4000.00	4250.00	4500.00	4750.00	5000.00	5250.00	5500.00	5750.00	6000.00
carbon+10	180.76	193.77	206.73	219.92	234.09	248.51	262.84	277.30	292.32	307.57	319.09	329.20
carbon+20	74.95	80.31	85.56	90.87	96.59	102.29	108.02	113.76	119.69	125.75	131.24	136.75
carbon+30	48.85	52.48	56.04	59.63	63.45	67.32	71.16	75.02	79.01	83.05	86.80	90.60
carbon+40	36.67	39.46	42.21	44.97	47.85	50.79	53.71	56.64	59.64	62.67	65.54	68.45
carbon+50	29.41	31.68	33.92	36.17	38.49	40.87	43.22	45.58	47.99	50.41	52.74	55.09
carbon+60	25.14	27.09	29.03	30.96	32.92	34.93	36.92	38.91	40.92	42.94	44.92	46.92
carbon+70	22.66	24.41	26.17	27.92	29.68	31.46	33.23	35.00	36.78	38.55	40.32	42.08
netcrb+10	243.12	257.34	272.77	287.98	305.26	320.17	336.83	352.33	368.30	385.14	397.19	406.70
netcrb+20	97.59	103.35	109.53	115.37	121.94	127.70	134.20	140.25	146.51	153.05	159.12	165.04
netcrb+30	59.70	63.62	67.64	71.69	75.95	80.09	84.26	88.34	92.45	96.75	100.85	104.93
netcrb+40	45.12	48.16	51.22	54.40	57.62	60.82	63.97	67.11	70.20	73.41	76.56	79.70
netcrb+50	37.35	39.86	42.47	45.12	47.75	50.37	52.94	55.56	58.08	60.68	63.28	65.86
netcrb+60	32.52	34.70	37.07	39.32	41.62	43.74	45.97	48.06	50.15	52.31	54.53	56.73
netcrb+70	28.07	30.01	32.22	34.21	36.26	38.09	40.06	41.90	43.74	45.60	47.55	49.46

Results for Price set 3 for l-trn-noh

	Price in $ per Acre moving into forest in 2000-2005											
	6250.00	6500.00	6750.00	7000.00	7250.00	7500.00	7750.00	8000.00	8250.00	8500.00	8750.00	9000.00
carbon+10	342.34	354.65	367.44	378.13	390.00	402.81	413.58	425.50	435.63	446.28	456.65	466.07
carbon+20	142.79	148.71	154.39	159.87	165.51	171.25	176.87	182.37	187.80	193.39	198.88	204.31
carbon+30	94.67	98.70	102.55	106.32	110.16	114.02	117.87	121.62	125.40	129.25	133.06	136.86
carbon+40	71.53	74.58	77.53	80.42	83.33	86.26	89.19	92.07	94.97	97.91	100.84	103.77
carbon+50	57.57	60.03	62.42	64.76	67.12	69.48	71.84	74.18	76.54	78.92	81.30	83.69
carbon+60	49.01	51.10	53.14	55.13	57.13	59.13	61.13	63.11	65.12	67.13	69.15	71.19
carbon+70	43.93	45.79	47.62	49.39	51.16	52.93	54.70	56.47	58.25	60.01	61.81	63.61
netcrb+10	420.80	433.77	448.07	459.10	471.84	486.51	497.48	510.69	520.71	531.38	542.15	551.00
netcrb+20	171.71	178.25	184.64	190.67	196.91	203.45	209.59	215.73	221.55	227.54	233.35	239.05
netcrb+30	109.36	113.74	118.00	122.10	126.27	130.59	134.74	138.86	142.89	146.99	151.18	155.19
netcrb+40	83.06	86.40	89.67	92.83	96.02	99.29	102.47	105.64	108.76	111.90	115.14	118.25
netcrb+50	68.59	71.27	73.97	76.57	79.18	81.87	84.41	87.03	89.60	92.18	94.80	97.36
netcrb+60	59.05	61.34	63.66	65.88	68.10	70.38	72.54	74.78	76.97	79.16	81.41	83.60
netcrb+70	51.47	53.49	55.54	57.48	59.41	61.39	63.30	65.26	67.18	69.06	71.06	72.97

Appendix Table 1c Land moving into the sequestration program by region

Price in $ per Acre

Price	PNWE	ne	LS	CB	SE	SC	RM	PSW
250	0	1555	0	0	0	6618	0	0
500	0	1417	0	0	0	6377	0	0
750	0	1445	0	32	0	6527	1714	0
1000	0	5241	296	2491	0	6215	1714	291
1250	129	5125	0	8266	0	6916	1714	287
1500	129	4961	0	8266	2659	8005	1714	281
1750	129	2567	3922	8266	3138	11263	1714	279
2000	129	2414	10932	8263	3138	10820	1714	272
2250	129	2574	15939	8263	3138	11440	1714	272
2500	129	2831	18933	8263	3138	13713	1714	272
2750	129	3075	20203	8263	3138	15351	1714	272
3000	129	4429	22002	8261	3135	16247	1714	272
3250	129	6678	23289	8260	3083	16957	1714	269
3500	129	9003	23289	8260	3058	17345	1714	269
3750	129	9911	23289	8260	3058	18307	1714	269
4000	129	10329	23289	8260	3058	19357	1913	269
4250	129	10640	23289	8260	3058	20115	2877	269
4500	129	10962	23289	8260	3481	21422	4387	269
4750	129	10962	23289	8260	3817	22276	5427	269
5000	129	11073	23289	8260	4006	23413	6713	269
5250	129	11073	23289	8260	4303	24707	8531	269
5500	127	11073	23289	8260	4672	25575	10234	269
5750	127	11073	23289	9303	4744	25844	10473	269
6000	127	11073	23289	11001	4834	25844	10726	269
6250	812	11073	23289	11720	4909	26145	11031	269
6500	1418	11073	23289	12651	5164	26193	11078	269
6750	1884	11073	23289	13068	5257	26572	10937	269
7000	1866	11073	23289	14283	5354	26568	11025	269
7250	1824	11073	23289	15104	5432	26699	11412	269
7500	1904	11073	23289	15513	5444	26836	11655	269
7750	1905	11073	23289	16748	5393	26851	11947	269
8000	1782	11073	23289	17306	5751	26861	12107	269
8250	1794	11073	23289	18609	5868	26899	12208	269
8500	1738	11073	23289	19841	5990	26899	12612	269
8750	1850	11073	23289	21012	6112	26899	12612	269
9000	1989	11073	23289	22572	6200	26899	12612	269

Appendix Table 2a Results for c-t-noh scenario

Basis for land transfer	Payments made for sequestered land based on carbon in 30 years (MMT)
Harvesting Assumption	Harvest can never occur on sequestered land
Land Transfer to Ag Assumption	Land transfers can freely occur

Raw Results for Price set 1 for c-t-noh

Price in $ per ton Carbon realized 2040-2045											
price	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00
+40carbpay	0	0	0	0	207	306	608	856	1053	1450	1649
landpay	0	0	0	0	2359	3500	6996	9883	12159	16963	19670
carbon+10	0	0	0	0	37	54	106	164	200	286	337
carbon+20	0	0	0	0	87	136	292	421	523	725	821
carbon+30	0	0	0	0	145	221	459	652	806	1112	1258
carbon+40	0	0	0	0	207	306	608	856	1053	1450	1649
carbon+50	0	0	0	0	270	392	758	1061	1300	1787	2040
carbon+60	0	0	0	0	325	463	872	1217	1484	2046	2353
carbon+70	0	0	0	0	364	511	939	1313	1595	2207	2561
netcrb+10	0	0	0	0	0	0	32	80	157	185	209
netcrb+20	0	0	0	0	0	43	137	206	278	365	410
netcrb+30	0	0	0	0	87	150	263	389	504	638	745
netcrb+40	0	0	0	0	194	272	350	521	628	843	991
netcrb+50	0	0	0	0	233	311	403	599	623	846	1040
netcrb+60	0	0	0	0	207	247	278	445	459	711	906
netcrb+70	0	0	0	0	243	283	301	485	592	719	937
progcost	0	0	0	0	1	2	5	8	11	16	20
cost/acre	0	0	0	0	527	612	696	780	866	940	1006
avgmicexi	2.42	2.42	2.42	2.42	2.42	2.42	2.43	2.44	2.46	2.46	2.47
avgmicseq	0.00	0.00	0.00	0.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
avgrotagex	43.11	43.11	43.11	43.11	43.14	43.18	42.32	41.71	41.73	41.84	41.97
avgrotagsq	0.00	0.00	0.00	0.00	47.71	45.00	41.23	44.09	43.57	45.33	49.10
ldinnow	9947	9947	9947	9947	11527	12266	13656	15381	15932	19876	22545
ldin10-20	6403	6403	6403	6403	7077	6813	6474	6377	6207	5680	5476
ldin30+	3172	3172	3172	3172	1402	563	480	133	0	0	0
ldoutnow	6543	6543	6543	6543	7649	7649	8011	8410	7794	8359	9058
ldout10-20	10653	10653	10653	10653	9684	9811	10568	10652	11142	11868	11641
ldout30+	24412	24412	24412	24412	23594	23127	22479	20394	18491	15867	15153

Appendix Table 2a Results for c-t-noh scenario(continued)

Raw Results for Price set 2 for c-t-noh

	Price	in $ per ton Carbon realized 2040-2045										
price	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00	21.00	22.00	23.00	24.00
+40carbpay	1805	2086	2278	2604	3086	3410	3759	4161	4600	4925	5190	5625
landpay	21582	25217	27291	30779	35653	38936	41391	45682	50795	54079	57047	61612
carbon+10	369	422	455	514	596	653	716	793	897	954	1003	1086
carbon+20	901	1040	1131	1284	1494	1636	1797	1976	2187	2331	2461	2682
carbon+30	1379	1594	1738	1980	2325	2557	2815	3103	3426	3662	3862	4194
carbon+40	1805	2086	2278	2604	3086	3410	3759	4161	4600	4925	5190	5625
carbon+50	2231	2574	2815	3225	3845	4262	4703	5217	5770	6182	6510	7044
carbon+60	2572	2972	3250	3728	4463	4959	5476	6089	6747	7233	7614	8234
carbon+70	2798	3236	3541	4069	4900	5463	6041	6738	7484	8028	8448	9127
netcrb+10	247	250	270	296	310	350	414	506	596	639	678	756
netcrb+20	436	535	581	692	786	900	1065	1266	1469	1595	1715	1932
netcrb+30	813	980	1085	1273	1505	1711	1950	2243	2550	2765	2959	3290
netcrb+40	1098	1302	1471	1745	2093	2381	2681	3059	3423	3701	3960	4392
netcrb+50	1211	1455	1594	1971	2450	2770	3129	3592	4056	4374	4707	5234
netcrb+60	1081	1424	1626	2085	2693	3099	3530	4075	4596	4998	5378	5993
netcrb+70	1088	1467	1720	2240	3036	3557	4086	4752	5407	5912	6327	7011
progcost	23	29	34	42	52	61	71	83	97	108	119	135
cost/acre	1088	1158	1252	1354	1472	1577	1726	1822	1902	2004	2093	2191
avgmicexi	2.47	2.47	2.48	2.48	2.48	2.48	2.48	2.48	2.49	2.49	2.49	2.49
avgmicseq	3.00	3.00	3.00	3.00	3.00	3.00	3.37	3.33	3.30	3.28	3.28	3.28
avgrotagex	41.86	41.62	41.46	41.45	41.25	41.10	41.02	41.06	41.16	40.97	41.01	41.03
avgrotagsq	49.79	51.29	50.61	49.88	48.71	48.03	48.13	48.35	48.39	48.41	47.67	46.66
ldinnow	24451	27641	29584	32586	35653	38936	41391	45682	50795	54079	57047	61612
ldin10-20	5655	5936	5810	5815	6562	5584	4502	3160	952	0	0	0
ldin30+	0	0	0	0	0	0	0	0	0	0	0	0
ldoutnow	9041	10116	10405	11284	12380	12798	12869	13038	13854	14330	14508	14670
ldout10-20	11918	11605	11541	10894	9805	9388	9325	9164	8349	7873	7695	7544
ldout30+	15071	14145	13663	12952	11885	10907	9817	8465	6256	5304	5304	5294

Appendix Table 2a Results for c-t-noh scenario(continued)

Raw Results for Price set 3 for c-t-noh

	Price	in $ per ton Carbon realized 2040-2045										
price	25.00	26.00	27.00	28.00	29.00	30.00	32.00	34.00	36.00	38.00	40.00	45.00
+40carbpay	5854	6021	6142	6234	6394	6596	6944	7123	7307	7465	7602	7922
landpay	63992	65574	66869	67734	69244	71183	74359	75989	77400	78887	80345	83626
carbon+10	1133	1167	1193	1213	1245	1284	1362	1402	1441	1477	1507	1579
carbon+20	2801	2885	2954	3003	3085	3183	3391	3498	3605	3699	3774	3955
carbon+30	4369	4495	4591	4663	4784	4934	5219	5365	5514	5643	5750	6005
carbon+40	5854	6021	6142	6234	6394	6596	6944	7123	7307	7465	7602	7922
carbon+50	7326	7533	7678	7791	7988	8242	8650	8860	9076	9263	9426	9808
carbon+60	8562	8803	8969	9100	9329	9629	10086	10322	10564	10775	10964	11402
carbon+70	9489	9756	9933	10074	10326	10661	11138	11383	11637	11859	12069	12546
netcrb+10	801	835	862	872	904	940	1011	1051	1087	1124	1155	1224
netcrb+20	2049	2132	2202	2244	2324	2419	2620	2728	2832	2929	3004	3183
netcrb+30	3459	3584	3682	3747	3867	4014	4294	4441	4589	4719	4826	5081
netcrb+40	4610	4776	4898	4982	5141	5343	5686	5861	6049	6204	6340	6659
netcrb+50	5503	5709	5854	5955	6154	6415	6825	7040	7253	7444	7607	7988
netcrb+60	6309	6548	6712	6838	7066	7366	7809	8059	8292	8511	8700	9137
netcrb+70	7357	7611	7780	7919	8163	8488	8948	9214	9454	9686	9896	10373
progcost	146	157	166	175	185	198	222	242	263	284	304	356
cost/acre	2287	2387	2480	2577	2678	2780	2988	3187	3399	3596	3784	4263
avgmicexi	2.49	2.49	2.49	2.49	2.49	2.49	2.49	2.48	2.48	2.48	2.48	2.48
avgmicseq	3.29	3.29	3.30	3.30	3.31	3.31	3.34	3.35	3.43	3.44	3.44	3.43
avgrotagex	40.98	41.00	41.00	40.95	40.95	40.97	41.03	41.06	41.05	41.08	41.08	41.08
avgrotagsq	46.38	46.18	46.01	45.82	45.61	45.43	44.64	44.38	44.09	44.03	44.44	44.92
ldinnow	63992	65574	66869	67734	69244	71183	74359	75989	77400	78887	80345	83626
ldin10-20	0	0	0	0	0	0	0	0	0	0	0	0
ldin30+	0	0	0	0	0	0	0	0	0	0	0	0
ldoutnow	14743	14743	14745	14981	14981	15031	15225	15279	15321	15321	15321	15418
ldout10-20	7470	7490	7488	7252	7252	7202	7017	6964	6925	6925	6925	6828
ldout30+	5293	5290	5290	5290	5290	5290	5282	5280	5278	5278	5278	5278

Appendix Table 2a Results for c-t-noh scenario(continued)

Raw Results for Price set 4 for c-t-noh

	Price	in $ per ton Carbon realized 2040-2045									
price	50.00	55.00	60.00	65.00	70.00	75.00	80.00	85.00	90.00	95.00	100.00
+40carbpay	8443	8974	9473	9903	10231	10428	10591	10880	11106	11316	11611
landpay	89258	94569	99511	103767	107026	108994	110601	113493	115764	117852	120765
carbon+10	1696	1839	1974	2091	2180	2234	2277	2356	2416	2474	2553
carbon+20	4241	4520	4785	5013	5186	5291	5379	5533	5653	5764	5922
carbon+30	6414	6820	7204	7534	7786	7938	8064	8286	8460	8621	8848
carbon+40	8443	8974	9473	9903	10231	10428	10591	10880	11106	11316	11611
carbon+50	10434	11083	11693	12219	12619	12860	13058	13411	13686	13942	14301
carbon+60	12128	12889	13603	14217	14685	14968	15198	15611	15933	16233	16651
carbon+70	13354	14217	15024	15719	16248	16568	16826	17294	17657	17998	18468
netcrb+10	1340	1483	1618	1735	1824	1877	1921	1999	2059	2116	2195
netcrb+20	3468	3748	4013	4240	4414	4519	4606	4760	4883	4993	5151
netcrb+30	5487	5892	6275	6605	6857	7009	7134	7357	7526	7686	7913
netcrb+40	7175	7703	8202	8632	8960	9157	9320	9609	9828	10037	10332
netcrb+50	8608	9256	9866	10391	10791	11040	11238	11591	11862	12124	12483
netcrb+60	9859	10619	11332	11947	12415	12704	12936	13348	13664	13973	14391
netcrb+70	11176	12036	12843	13538	14068	14388	14648	15115	15466	15811	16282
progcost	422	494	568	644	716	782	847	925	1000	1075	1161
cost/acre	4730	5219	5712	6203	6691	7176	7661	8149	8635	9122	9614
avgmicexi	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48
avgmicseq	3.42	3.40	3.38	3.37	3.36	3.35	3.35	3.35	3.34	3.34	3.33
avgrotagex	41.03	41.02	41.02	41.02	41.02	41.00	41.00	41.00	40.96	40.96	40.96
avgrotagsq	46.24	48.07	49.47	50.54	51.29	51.69	51.95	52.51	52.90	53.30	53.73
ldinnow	89258	94569	99511	103767	107026	108994	110601	113493	115764	117852	120765
ldin10-20	0	0	0	0	0	0	0	0	0	0	0
ldin30+	0	0	0	0	0	0	0	0	0	0	0
ldoutnow	15466	15467	15480	15480	15480	15480	15480	15481	15480	15481	15481
ldout10-20	6853	6852	6840	6843	6843	6843	6843	6841	6882	6881	6881
ldout30+	5205	5205	5174	5171	5171	5059	5141	5141	5101	5101	5101

Appendix Table 2b Cost per ton carbon Results
There are many different bases on which this can be computed
Here we compute all almost all of them on a time period by time period basis

Results for Price set 1 for c-t-noh

	Price in	in $ per ton Carbon realized 2040-2045									
	0.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00
carbon+10						33.42	39.44	45.78	46.92	52.58	55.71	58.66
carbon+20						14.27	15.74	16.67	18.31	20.15	22.00	24.09
carbon+30						8.57	9.69	10.60	11.82	13.06	14.34	15.73
carbon+40						6.00	7.00	8.00	9.00	10.00	11.00	12.00
carbon+50						4.61	5.47	6.42	7.27	8.10	8.92	9.70
carbon+60						3.82	4.62	5.58	6.33	7.10	7.80	8.41
carbon+70						3.41	4.19	5.18	5.87	6.60	7.23	7.73
netcrb+10								150.18	95.98	66.96	86.06	94.65
netcrb+20							49.38	35.40	37.39	37.82	43.65	48.22
netcrb+30						14.29	14.25	18.51	19.82	20.88	25.01	26.56
netcrb+40						6.40	7.89	13.90	14.80	16.77	18.92	19.98
netcrb+50						5.33	6.89	12.07	12.86	16.90	18.84	19.03
netcrb+60						6.00	8.69	17.48	17.31	22.94	22.43	21.83
netcrb+70						5.11	7.58	16.16	15.90	17.80	22.20	21.13

Results for Price set 2 for c-t-noh

	Price in	in $ per ton Carbon realized 2040-2045										
	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00	21.00	22.00	23.00	24.00
carbon+10	63.57	69.28	75.04	81.04	88.03	93.96	99.71	104.98	107.68	113.53	119.06	124.31
carbon+20	26.05	28.07	30.21	32.46	35.12	37.53	39.75	42.12	44.17	46.48	48.50	50.34
carbon+30	17.02	18.32	19.66	21.04	22.56	24.01	25.38	26.82	28.19	29.59	30.91	32.19
carbon+40	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00	21.00	22.00	23.00	24.00
carbon+50	10.52	11.35	12.14	12.92	13.65	14.40	15.19	15.95	16.74	17.53	18.34	19.17
carbon+60	9.12	9.83	10.51	11.18	11.76	12.38	13.04	13.67	14.32	14.98	15.68	16.40
carbon+70	8.39	9.03	9.65	10.24	10.71	11.24	11.82	12.35	12.91	13.50	14.13	14.79
netcrb+10	94.89	116.71	126.52	140.66	169.33	175.54	172.70	164.48	162.00	169.45	176.02	178.54
netcrb+20	53.81	54.58	58.85	60.23	66.77	68.20	67.04	65.72	65.76	67.92	69.62	69.89
netcrb+30	28.87	29.81	31.51	32.73	34.86	35.88	36.64	37.11	37.88	39.19	40.35	41.03
netcrb+40	21.38	22.44	23.23	23.88	25.06	25.78	26.64	27.20	28.22	29.28	30.15	30.74
netcrb+50	19.39	20.07	21.43	21.14	21.41	22.16	22.83	23.17	23.82	24.77	25.36	25.79
netcrb+60	21.72	20.51	21.02	19.99	19.48	19.81	20.24	20.42	21.02	21.68	22.20	22.53
netcrb+70	21.58	19.91	19.87	18.61	17.28	17.26	17.48	17.51	17.86	18.33	18.87	19.26

Results for Price set 3 for c-t-noh

	Price in $ per ton Carbon realized 2040-2045											
	25.00	26.00	27.00	28.00	29.00	30.00	32.00	34.00	36.00	38.00	40.00	45.00
carbon+10	129.12	134.15	138.95	143.96	148.95	154.08	163.11	172.69	182.52	192.10	201.73	225.76
carbon+20	52.24	54.25	56.13	58.12	60.11	62.17	65.54	69.24	72.97	76.70	80.57	90.14
carbon+30	33.50	34.82	36.12	37.44	38.76	40.11	42.58	45.14	47.70	50.27	52.88	59.36
carbon+40	25.00	26.00	27.00	28.00	29.00	30.00	32.00	34.00	36.00	38.00	40.00	45.00
carbon+50	19.98	20.78	21.60	22.41	23.21	24.01	25.69	27.33	28.98	30.63	32.26	36.35
carbon+60	17.09	17.78	18.49	19.18	19.88	20.55	22.03	23.46	24.90	26.33	27.73	31.26
carbon+70	15.42	16.05	16.70	17.33	17.96	18.56	19.95	21.28	22.60	23.92	25.19	28.41
netcrb+10	182.60	187.48	192.37	200.21	205.13	210.55	219.76	230.50	241.94	252.33	263.31	291.23
netcrb+20	71.43	73.41	75.33	77.80	79.77	81.80	84.81	88.77	92.88	96.87	101.23	112.00
netcrb+30	42.31	43.67	45.04	46.59	47.95	49.31	51.75	54.53	57.32	60.11	63.00	70.16
netcrb+40	31.74	32.77	33.86	35.04	36.07	37.04	39.08	41.32	43.49	45.73	47.96	53.53
netcrb+50	26.59	27.42	28.33	29.31	30.13	30.85	32.56	34.40	36.27	38.11	39.97	44.63
netcrb+60	23.20	23.91	24.71	25.53	26.24	26.86	28.45	30.05	31.72	33.33	34.95	39.01
netcrb+70	19.89	20.57	21.32	22.04	22.71	23.31	24.83	26.28	27.82	29.29	30.73	34.37

Results for Price set 4 for c-t-noh

	Price in $ per ton Carbon realized 2040-2045										
	50.00	55.00	60.00	65.00	70.00	75.00	80.00	85.00	90.00	95.00	100.00
carbon+10	248.93	268.35	287.86	307.78	328.46	350.12	372.07	392.61	413.65	434.58	454.86
carbon+20	99.54	109.18	118.79	128.41	138.08	147.81	157.52	167.16	176.82	186.51	196.07
carbon+30	65.81	72.36	78.90	85.44	91.98	98.53	105.08	111.61	118.15	124.70	131.22
carbon+40	50.00	55.00	60.00	65.00	70.00	75.00	80.00	85.00	90.00	95.00	100.00
carbon+50	40.46	44.53	48.61	52.68	56.75	60.82	64.89	68.96	73.04	77.10	81.19
carbon+60	34.81	38.29	41.78	45.27	48.77	52.25	55.75	59.24	62.74	66.23	69.73
carbon+70	31.61	34.71	37.83	40.95	44.07	47.21	50.35	53.48	56.61	59.73	62.87
netcrb+10	315.02	332.79	351.27	371.02	392.64	416.58	441.12	462.63	485.48	508.10	529.05
netcrb+20	121.71	131.67	141.65	151.80	162.24	173.07	183.94	194.29	204.70	215.29	225.40
netcrb+30	76.94	83.76	90.57	97.45	104.44	111.59	118.76	125.71	132.82	139.87	146.72
netcrb+40	58.84	64.07	69.29	74.57	79.93	85.41	90.91	96.25	101.71	107.10	112.38
netcrb+50	49.04	53.32	57.61	61.94	66.36	70.85	75.40	79.79	84.26	88.67	93.01
netcrb+60	42.82	46.48	50.15	53.88	57.68	61.56	65.50	69.28	73.16	76.93	80.68
netcrb+70	37.77	41.01	44.26	47.55	50.91	54.36	57.84	61.18	64.63	67.99	71.31

Appendix Table 2c Land moving into the sequestration program by region

Price in $ per ton Carbon

Price	PNWE	ne	LS	CB	SE	SC	RM	PSW
2	0	1556	0	0	0	6618	0	0
3	0	1556	0	0	0	6618	0	0
4	0	1556	0	0	0	6618	0	0
5	0	1556	0	0	0	6618	0	0
6	0	981	207	0	0	6413	0	0
7	0	1280	448	0	0	6535	0	0
8	0	1486	438	0	0	6990	0	0
9	0	1575	91	35	0	7056	0	0
10	0	1889	448	430	0	7146	0	0
11	0	2433	448	2283	0	7427	515	0
12	0	2146	167	3753	0	7397	1714	0
13	0	2932	448	4202	0	7574	1714	0
14	0	5344	0	4298	0	8006	1714	0
15	0	5213	499	4431	0	9022	1714	0
16	0	4727	1788	4742	0	10036	1714	0
17	0	2735	5247	4513	0	10836	1714	0
18	0	2567	7824	4558	0	11334	1714	0
19	0	2567	9831	5006	0	11263	1714	0
20	0	2567	12837	5473	0	11263	1714	0
21	0	2414	15182	7247	0	11124	1714	0
22	0	2414	16432	8263	374	10844	1714	0
23	0	2414	17516	8263	1747	11178	1714	0
24	0	2414	19196	8263	3138	12517	1714	0
25	0	2414	19975	8263	3138	13644	1714	272
26	0	2414	20838	8263	3138	14364	1714	272
27	129	2414	20918	8261	3138	15279	1714	272
28	129	2414	21257	8261	3138	15569	1714	272
29	129	2414	22015	8261	3138	16321	1714	272
30	129	2414	23289	8261	3088	16987	1714	272
32	129	2414	23289	8260	3138	19921	1714	269
34	129	2414	23289	8260	3083	21552	1714	269
36	129	2414	23289	8260	3058	22946	1714	269
38	129	2624	23289	8260	3058	24223	1714	269
40	129	3781	23289	8260	3058	24524	1714	269
45	129	5698	23289	8260	3058	25791	1714	269
50	129	10371	23289	8260	3010	26749	1714	269
55	129	10962	23289	12913	3010	26817	1713	269
60	129	11073	23289	17358	3146	27056	1713	269
65	129	11073	23289	21243	3336	27236	1713	269
70	129	11073	23289	24169	3594	27311	1713	269
75	129	11073	23289	25912	3759	27371	1713	269
80	129	11073	23289	27205	3901	27543	1713	269
85	129	11073	23289	29744	4238	27558	1712	269
90	129	11073	23289	31643	4611	27558	1713	269
95	127	11073	23289	33576	4766	27558	1713	269
100	127	11073	23289	35995	4994	27825	1713	269

Appendix Table 3a Results for c-h-50yr scenario

Basis for land transfer	Payments made for sequestered land based on carbon in 30 years (MMT)
Harvesting Assumption	Harvest can occur after 50 years (MMT) on sequestered land
Land Transfer to Ag Assumption	Land transfers can freely occur

Raw Results for Price set 1 for c-h-50yr

Price	in $ per ton Carbon realized 2040-2045										
price	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00
+40carbpay	329	1135	1831	2385	2895	3384	3857	4349	4789	5206	5849
landpay	3758	12941	20850	26824	32221	37234	42050	47566	51771	55980	62132
carbon+10	57	187	308	403	492	579	675	788	882	982	1131
carbon+20	148	555	870	1119	1348	1560	1808	2061	2280	2496	2840
carbon+30	239	870	1377	1780	2151	2498	2863	3238	3569	3888	4389
carbon+40	329	1135	1831	2385	2895	3384	3857	4349	4789	5206	5849
carbon+50	419	1404	2290	2996	3647	4276	4855	5459	6005	6518	7297
carbon+60	100	474	865	1092	1721	2423	3081	3561	4063	4458	5172
carbon+70	46	281	618	779	989	1242	1854	2116	2585	2950	3349
netcrb+10	4	79	141	174	182	230	310	427	499	593	723
netcrb+20	47	200	339	461	582	761	969	1204	1388	1554	1869
netcrb+30	149	398	667	892	1136	1435	1762	2086	2392	2616	3078
netcrb+40	244	342	759	1051	1312	1674	2044	2458	2840	3106	3522
netcrb+50	169	172	604	945	1225	1630	2030	2460	2904	3220	3506
netcrb+60	2	0	64	115	336	714	995	1350	1781	2023	2204
netcrb+70	0	0	0	0	55	300	482	653	1064	1207	1247
progcost	0	3	7	12	17	24	31	39	48	57	70
cost/acre	175	263	351	445	539	636	734	823	925	1023	1130
avgmicexi	2.41	2.37	2.36	2.33	2.30	2.28	2.25	2.25	2.22	2.19	2.10
avgmicseq	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.11	3.16	3.36
avgrotagex	43.45	45.41	46.71	47.32	48.70	49.02	49.46	49.61	50.09	50.33	50.61
avgrotagsq	43.71	40.35	45.52	46.28	46.86	47.70	48.84	50.06	51.82	52.06	52.27
ldinnow	12304	15283	22495	27999	32405	37234	42050	47566	51771	55980	62132
ldin10-20	5887	5357	3746	3118	1531	0	0	0	0	0	0
ldin30+	378	0	0	0	0	0	0	0	0	0	0
ldoutnow	7496	8153	9489	10508	12266	12816	13269	13334	14406	14653	14981
ldout10-20	9272	10616	10977	11356	9672	9121	8908	8871	7829	7583	7262
ldout30+	23894	23959	28455	32027	34213	37370	42061	47575	51768	56741	63393

Appendix Table 3a Results for c-h-50yr scenario(continued)

Raw Results for Price set 2 for c-h-50yr

	Price	in $ per ton Carbon realized 2040-2045										
price	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00	21.00	22.00	23.00	24.00
+40carbpay	6196	6502	6860	7003	7214	7453	7758	7990	8147	8272	8474	8683
landpay	66054	68939	72886	74471	76626	79130	82332	84762	86520	87843	89811	91751
carbon+10	1211	1275	1348	1376	1423	1477	1545	1597	1631	1658	1703	1750
carbon+20	3009	3166	3351	3431	3551	3685	3855	3984	4069	4135	4252	4376
carbon+30	4648	4881	5156	5271	5439	5628	5870	6053	6175	6272	6434	6604
carbon+40	6196	6502	6860	7003	7214	7453	7758	7990	8147	8272	8474	8683
carbon+50	7730	8108	8545	8714	8966	9252	9617	9894	10084	10236	10475	10720
carbon+60	5426	5600	5856	5967	6201	6456	6802	7012	7074	7266	7527	7809
carbon+70	3435	3495	3890	3997	4145	4238	4342	4501	4543	4724	4975	5250
netcrb+10	773	835	902	928	976	1024	1092	1145	1171	1196	1243	1289
netcrb+20	1989	2133	2291	2359	2464	2571	2725	2833	2901	2965	3070	3187
netcrb+30	3293	3490	3719	3816	3965	4111	4315	4442	4533	4621	4770	4909
netcrb+40	3810	4067	4379	4500	4661	4838	5087	5233	5368	5480	5670	5828
netcrb+50	3777	4106	4443	4558	4720	4927	5226	5393	5564	5685	5875	6076
netcrb+60	2353	2570	2745	2810	3006	3217	3530	3659	3765	3876	4066	4303
netcrb+70	1271	1417	1441	1506	1692	1755	1888	1990	2059	2239	2420	2652
progcost	81	91	103	112	123	134	147	160	171	182	195	208
cost/acre	1219	1320	1412	1505	1600	1695	1790	1885	1977	2072	2170	2271
avgmicexi	2.09	2.09	2.08	2.08	2.06	2.06	2.05	2.03	2.03	2.02	2.02	2.02
avgmicseq	3.34	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.37	3.40	3.41	3.42
avgrotagex	50.65	50.83	50.78	51.27	51.32	51.21	51.10	50.77	50.73	50.32	50.19	50.31
avgrotagsq	52.80	52.81	52.83	52.58	53.18	53.65	54.25	54.32	54.31	54.35	54.47	54.21
ldinnow	66054	68939	72886	74471	76626	79130	82332	84762	86520	87843	89811	91751
ldin10-20	0	0	0	0	0	0	0	0	0	0	0	0
ldin30+	0	0	0	0	0	0	0	0	0	0	0	0
ldoutnow	15278	15279	15305	15321	15366	15510	15510	15510	15511	15511	15523	15523
ldout10-20	6971	7035	7020	7004	7061	6942	6942	6942	6942	6942	6931	6933
ldout30+	67315	70133	74061	75597	77719	80200	83331	85886	87760	88176	89434	92019

Appendix Table 3a Results for c-h-50yr scenario(continued)

Raw Results for Price set 3 for c-h-50yr

Price	in $ per ton Carbon realized 2040-2045											
price	25.00	26.00	27.00	28.00	29.00	30.00	32.00	34.00	36.00	38.00	40.00	45.00
+40carbpay	8855	9034	9157	9307	9466	9601	9847	10100	10274	10511	10663	11193
landpay	93433	95144	96351	97851	99448	100804	103240	105793	107542	110109	111745	117369
carbon+10	1796	1841	1874	1916	1959	1996	2058	2126	2173	2232	2270	2405
carbon+20	4468	4567	4632	4712	4796	4868	5002	5137	5230	5351	5428	5702
carbon+30	6737	6878	6972	7088	7210	7314	7506	7700	7834	8013	8127	8529
carbon+40	8855	9034	9157	9307	9466	9601	9847	10100	10274	10511	10663	11193
carbon+50	10930	11145	11296	11480	11674	11839	12135	12444	12655	12950	13138	13793
carbon+60	7891	8101	8261	8484	8721	8906	9272	9623	9784	9951	10070	10622
carbon+70	5302	5416	5478	5581	5656	5720	5948	6082	6106	6178	6296	6791
netcrb+10	1335	1382	1418	1450	1493	1536	1570	1638	1681	1740	1777	1909
netcrb+20	3245	3309	3371	3424	3507	3585	3645	3734	3818	3939	4017	4303
netcrb+30	4964	5080	5179	5239	5347	5410	5496	5621	5754	5932	6048	6408
netcrb+40	5882	6000	6099	6165	6294	6367	6514	6691	6851	7090	7246	7692
netcrb+50	6150	6286	6403	6530	6686	6766	6969	7179	7361	7657	7847	8338
netcrb+60	4337	4459	4577	4723	4888	4963	5221	5456	5571	5748	5865	6209
netcrb+70	2758	2856	3003	3129	3219	3258	3509	3707	3774	3870	3978	4299
progcost	221	235	247	261	275	288	315	343	370	399	427	504
cost/acre	2369	2469	2566	2663	2761	2857	3052	3246	3439	3628	3817	4291
avgmicexi	2.01	1.99	1.99	1.99	1.99	1.99	1.99	1.98	1.99	1.99	1.99	1.99
avgmicseq	3.41	3.41	3.41	3.40	3.40	3.39	3.39	3.38	3.38	3.37	3.37	3.36
avgrotagex	49.95	49.96	50.30	50.21	50.02	49.76	49.26	48.83	48.81	48.85	48.78	48.05
avgrotagsq	54.16	54.05	54.04	53.86	53.91	53.77	53.70	53.74	53.51	53.44	53.43	52.98
ldinnow	93433	95144	96351	97851	99448	100804	103240	105793	107542	110109	111745	117369
ldin10-20	0	0	0	0	0	0	0	0	0	0	0	0
ldin30+	0	0	0	0	0	0	0	0	0	0	0	0
ldoutnow	15523	15523	15525	15525	15525	15525	15529	15529	15529	15529	15540	15540
ldout10-20	6937	6937	6935	6935	6935	6935	6931	6935	6932	6932	6921	6924
ldout30+	93544	95580	96856	98130	99869	101245	104229	106755	108441	111088	112833	118681

Appendix Table 3a Results for c-h-50yr scenario(continued)

Raw Results for Price set 4 for c-h-50yr

	Price	in $ per ton Carbon realized 2040-2045									
price	50.00	55.00	60.00	65.00	70.00	75.00	80.00	85.00	90.00	95.00	100.00
+40carbpay	11558	11954	12297	12580	12984	13249	13452	13608	13749	13925	14208
landpay	121366	125613	129274	132316	136628	139591	141956	143800	145444	147250	150096
carbon+10	2497	2595	2676	2745	2846	2911	2959	2995	3029	3075	3152
carbon+20	5885	6089	6272	6418	6624	6756	6855	6929	6997	7089	7238
carbon+30	8801	9101	9365	9580	9884	10081	10231	10344	10448	10582	10798
carbon+40	11558	11954	12297	12580	12984	13249	13452	13608	13749	13925	14208
carbon+50	14249	14739	15160	15511	16012	16344	16601	16799	16978	17194	17541
carbon+60	11123	11523	11633	11806	11879	11933	11989	12056	12124	12164	12186
carbon+70	7384	7798	7836	7948	7923	7954	7981	8030	8091	8071	8012
netcrb+10	2006	2103	2183	2249	2349	2414	2462	2499	2535	2583	2660
netcrb+20	4469	4672	4869	5012	5220	5353	5452	5528	5597	5688	5829
netcrb+30	6614	6918	7217	7429	7735	7938	8086	8200	8305	8436	8634
netcrb+40	7912	8302	8659	8938	9348	9622	9823	9981	10123	10293	10572
netcrb+50	8546	9017	9443	9786	10291	10636	10894	11092	11276	11487	11842
netcrb+60	6414	6804	6967	7164	7312	7429	7523	7610	7706	7773	7852
netcrb+70	4529	4889	4923	5026	5011	5036	5068	5110	5176	5181	5160
progcost	578	657	738	818	909	994	1076	1157	1237	1323	1421
cost/acre	4762	5234	5708	6180	6652	7118	7581	8044	8508	8984	9466
avgmicexi	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	2.00	1.99
avgmicseq	3.35	3.34	3.34	3.34	3.33	3.32	3.32	3.31	3.31	3.31	3.30
avgrotagex	46.89	46.72	46.53	46.56	46.51	46.44	46.44	46.43	46.39	46.54	46.80
avgrotagsq	52.38	52.14	51.91	51.89	51.71	51.62	51.57	51.58	51.59	51.61	51.67
ldinnow	121366	125613	129274	132316	136627	139591	141956	143800	145444	147250	150096
ldin10-20	0	0	0	0	0	0	0	0	0	0	0
ldin30+	0	0	0	0	0	0	0	0	0	0	0
ldoutnow	15540	15540	15540	15542	15542	15549	15555	15555	15555	15555	15555
ldout10-20	6924	6924	6924	6924	6924	6917	6911	6911	6911	6911	6911
ldout30+	122715	126966	130601	133613	137978	140944	143291	145015	146657	147926	150096

Appendix Table 3b Cost per ton carbon Results
There are many different bases on which this can be computed
Here we compute all almost all of them on a time period by time period basis

Results for Price set 1 for c-h-50yr

	Price in	in $ per ton Carbon realized 2040-2045									
	0.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00
carbon+10		0.00	18.19	23.81	29.56	35.32	40.89	45.69	49.67	54.29	58.29	62.07
carbon+20		0.00	6.13	8.42	10.65	12.89	15.18	17.07	18.99	21.00	22.94	24.72
carbon+30		0.00	3.92	5.32	6.70	8.08	9.48	10.78	12.09	13.42	14.73	15.99
carbon+40		0.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00
carbon+50		0.00	2.43	3.20	3.98	4.76	5.54	6.36	7.17	7.98	8.79	9.62
carbon+60		0.00	7.18	8.46	10.92	10.09	9.78	10.02	10.99	11.79	12.84	13.57
carbon+70		0.00	12.13	11.84	15.31	17.57	19.06	16.65	18.50	18.52	19.41	20.96
netcrb+10		0.00	43.01	51.89	68.41	95.52	102.91	99.40	91.74	95.89	96.60	97.11
netcrb+20		0.00	17.04	21.61	25.89	29.85	31.12	31.85	32.51	34.50	36.85	37.55
netcrb+30		0.00	8.55	10.98	13.37	15.29	16.51	17.52	18.77	20.02	21.89	22.80
netcrb+40		0.00	9.97	9.65	11.35	13.25	14.15	15.10	15.93	16.86	18.44	19.93
netcrb+50		0.00	19.83	12.12	12.63	14.18	14.53	15.20	15.91	16.49	17.79	20.02
netcrb+60		0.00		113.70	103.57	51.66	33.18	31.00	28.99	26.89	28.31	31.85
netcrb+70						315.97	78.94	64.05	59.97	45.00	47.46	56.27

Results for Price set 2 for c-h-50yr

	Price in	in $ per ton Carbon realized 2040-2045										
	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00	21.00	22.00	23.00	24.00
carbon+10	66.51	71.41	76.36	81.43	86.17	90.84	95.39	100.05	104.88	109.79	114.46	119.10
carbon+20	26.77	28.75	30.71	32.65	34.54	36.41	38.24	40.11	42.05	44.01	45.84	47.62
carbon+30	17.33	18.65	19.96	21.26	22.55	23.84	25.11	26.40	27.71	29.02	30.29	31.55
carbon+40	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00	21.00	22.00	23.00	24.00
carbon+50	10.42	11.23	12.04	12.86	13.68	14.50	15.33	16.15	16.97	17.78	18.61	19.44
carbon+60	14.84	16.26	17.57	18.78	19.78	20.78	21.67	22.79	24.19	25.05	25.89	26.68
carbon+70	23.45	26.05	26.45	28.03	29.59	31.65	33.95	35.50	37.66	38.53	39.18	39.69
netcrb+10	104.18	108.98	114.08	120.73	125.63	131.05	135.01	139.58	146.15	152.11	156.84	161.69
netcrb+20	40.49	42.68	44.91	47.50	49.77	52.18	54.09	56.41	58.98	61.37	63.47	65.39
netcrb+30	24.46	26.08	27.67	29.36	30.93	32.64	34.16	35.98	37.74	39.38	40.85	42.45
netcrb+40	21.14	22.38	23.50	24.90	26.31	27.73	28.98	30.54	31.87	33.21	34.37	35.76
netcrb+50	21.33	22.17	23.16	24.58	25.98	27.23	28.21	29.63	30.75	32.01	33.17	34.30
netcrb+60	34.24	35.43	37.48	39.88	40.79	41.71	41.75	43.67	45.45	46.95	47.93	48.43
netcrb+70	63.37	64.24	71.42	74.42	72.50	76.46	78.06	80.32	83.10	81.29	80.54	78.57

Results for Price set 3 for c-h-50yr

	Price in $ per ton Carbon realized 2040-2045											
	25.00	26.00	27.00	28.00	29.00	30.00	32.00	34.00	36.00	38.00	40.00	45.00
carbon+10	123.27	127.57	131.89	136.03	140.15	144.34	153.11	161.53	170.24	178.94	187.89	209.41
carbon+20	49.55	51.43	53.37	55.31	57.24	59.17	62.99	66.85	70.72	74.65	78.58	88.34
carbon+30	32.86	34.15	35.46	36.77	38.08	39.38	41.98	44.60	47.21	49.85	52.48	59.06
carbon+40	25.00	26.00	27.00	28.00	29.00	30.00	32.00	34.00	36.00	38.00	40.00	45.00
carbon+50	20.25	21.07	21.89	22.70	23.52	24.33	25.97	27.60	29.23	30.84	32.46	36.52
carbon+60	28.05	28.99	29.93	30.72	31.48	32.34	33.98	35.69	37.80	40.14	42.35	47.42
carbon+70	41.76	43.37	45.13	46.70	48.54	50.35	52.98	56.47	60.57	64.65	67.74	74.17
netcrb+10	165.76	169.92	174.39	179.67	183.90	187.59	200.73	209.60	219.96	229.52	239.96	263.79
netcrb+20	68.22	70.98	73.34	76.11	78.28	80.35	86.44	91.96	96.86	101.39	106.17	117.06
netcrb+30	44.59	46.24	47.74	49.75	51.34	53.24	57.34	61.10	64.28	67.34	70.52	78.60
netcrb+40	37.63	39.14	40.53	42.27	43.62	45.24	48.38	51.33	53.99	56.34	58.86	65.48
netcrb+50	36.00	37.37	38.61	39.91	41.06	42.57	45.22	47.84	50.25	52.16	54.35	60.41
netcrb+60	51.04	52.67	54.02	55.18	56.17	58.04	60.36	62.94	66.39	69.50	72.72	81.13
netcrb+70	80.25	82.25	82.33	83.29	85.28	88.41	89.80	92.63	97.99	103.22	107.21	117.18

Results for Price set 4 for c-h-50yr

	Price in $ per ton Carbon realized 2040-2045										
	50.00	55.00	60.00	65.00	70.00	75.00	80.00	85.00	90.00	95.00	100.00
carbon+10	231.41	253.31	275.71	297.95	319.38	341.37	363.69	386.16	408.54	430.13	450.73
carbon+20	98.20	107.97	117.65	127.41	137.21	147.08	157.00	166.92	176.84	186.60	196.30
carbon+30	65.66	72.24	78.78	85.36	91.95	98.57	105.19	111.82	118.44	125.01	131.58
carbon+40	50.00	55.00	60.00	65.00	70.00	75.00	80.00	85.00	90.00	95.00	100.00
carbon+50	40.56	44.61	48.67	52.72	56.76	60.80	64.83	68.85	72.88	76.94	81.00
carbon+60	51.96	57.06	63.43	69.26	76.51	83.27	89.76	95.94	102.07	108.75	116.59
carbon+70	78.26	84.31	94.16	102.89	114.72	124.93	134.84	144.04	152.94	163.90	177.32
netcrb+10	288.11	312.56	337.98	363.62	386.88	411.67	437.05	462.81	488.04	512.24	534.09
netcrb+20	129.31	140.73	151.54	163.15	174.11	185.61	197.41	209.23	221.08	232.55	243.74
netcrb+30	87.37	95.03	102.24	110.08	117.50	125.18	133.09	141.06	149.00	156.81	164.56
netcrb+40	73.04	79.19	85.21	91.49	97.23	103.27	109.55	115.89	122.24	128.52	134.39
netcrb+50	67.62	72.91	78.13	83.56	88.32	93.43	98.79	104.28	109.74	115.16	119.98
netcrb+60	90.10	96.63	105.91	114.14	124.31	133.76	143.06	152.00	160.59	170.19	180.94
netcrb+70	127.60	134.48	149.87	162.70	181.39	197.29	212.36	226.34	239.07	255.31	275.32

Appendix Table 3c Land moving into the sequestration program by region

Price in $ per ton Carbon

Price	PNWE	ne	LS	CB	SE	SC	RM	PSW
2	0	1572	448	0	0	6359	0	0
3	0	1862	1424	0	0	7330	0	0
4	0	1165	4228	0	0	9823	1435	0
5	0	696	7167	0	0	11257	1714	0
6	0	0	10191	0	0	11449	1714	0
7	0	0	14246	0	0	11607	1714	0
8	0	0	15967	0	269	13954	1714	0
9	0	0	16978	0	755	15114	1714	0
10	0	446	18361	1033	862	15251	1714	0
11	0	221	19459	3171	968	16096	1714	0
12	0	820	19948	5990	1449	17532	1714	0
13	0	1276	21109	7771	1800	17408	1714	0
14	0	1353	22522	7917	1601	18854	1714	0
15	0	2414	23289	8260	2236	19970	1714	0
16	0	2414	23289	8260	3058	20717	1714	0
17	0	3625	23289	8260	3058	21661	1669	0
18	0	5332	23289	8260	3010	22361	1669	0
19	0	7556	23289	8260	3010	23339	1669	0
20	0	9241	23289	8260	3010	24084	1669	0
21	0	10222	23289	8260	3010	24461	1669	269
22	129	11126	23289	8260	3010	24580	1669	269
23	129	11829	23289	8260	2998	25845	1669	269
24	129	12005	23289	8260	2998	27609	1669	269
25	129	12005	23289	9704	2998	27846	1669	269
26	129	12006	23289	10718	2998	28543	1669	269
27	127	12007	23289	11819	2998	28648	1669	269
28	127	12007	23289	13246	3078	28640	1669	269
29	127	12007	23289	14622	3320	28620	1669	269
30	127	12009	23289	15828	3503	28584	1669	269
32	127	12312	23289	17211	3684	29149	1669	269
34	127	12477	23289	19335	3959	29138	1669	269
36	127	12479	23289	20739	4320	29121	1669	269
38	127	12479	23289	22441	4468	29227	2281	269
40	116	12479	23289	23530	4463	29341	2718	269
45	116	12479	23289	27413	4925	29581	3757	269
50	116	12479	23289	30242	4999	29571	4861	269
55	116	12479	23289	32811	5262	29988	5859	269
60	116	12479	23289	34226	5495	31045	6815	269
65	116	12479	23289	35836	5528	31610	7647	269
70	116	12479	23289	38743	5432	32052	8704	269
75	116	12479	23289	40593	5565	32052	9679	269
80	116	12479	23289	41904	5606	32052	10686	269
85	116	12479	23289	42859	5606	32052	11574	269
90	116	12479	23289	43819	5556	32052	12308	269
95	116	12479	23289	45282	5757	32052	12451	269
100	116	12479	23289	47886	5895	32052	12554	269

Appendix Table 4a Results for c-trn scenario

Basis for land transfer	Payments made for sequestered land based on carbon in 30 years (MMT)
Harvesting Assumption	Harvest can occur at any time on sequestered land
Land Transfer to Ag Assumption	Land transfers can freely occur

Raw Results for Price set 1 for c-trn

Price	in $ per ton Carbon realized 2040-2045										
price	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00
+40carbpay	960	1604	2666	3321	3793	4313	4721	5164	5539	5898	6219
landpay	12167	17804	29358	36473	41278	46373	50664	55459	59039	62157	65647
carbon+10	173	272	462	571	663	761	838	923	999	1076	1157
carbon+20	522	768	1236	1534	1767	2018	2210	2429	2636	2830	3007
carbon+30	815	1206	1971	2453	2808	3194	3494	3829	4126	4410	4662
carbon+40	774	1604	2666	3321	3793	4313	4721	5164	5539	5898	6219
carbon+50	226	653	997	1442	1777	2465	2977	3524	4046	4523	4818
carbon+60	128	276	544	699	823	1050	1458	1933	2251	2772	3021
carbon+70	46	159	330	459	555	703	877	1033	1189	1556	1761
netcrb+10	39	94	209	230	303	385	430	512	592	660	732
netcrb+20	126	329	521	714	910	1133	1281	1475	1662	1830	1979
netcrb+30	196	472	793	1185	1446	1748	1983	2239	2498	2742	2941
netcrb+40	126	339	802	1311	1582	1936	2229	2503	2815	3071	3273
netcrb+50	51	0	72	482	645	1006	1302	1680	1958	2147	2318
netcrb+60	0	0	0	0	0	0	10	372	510	563	665
netcrb+70	0	0	0	0	0	0	0	39	99	94	39
progcost	2	5	11	17	23	30	38	46	55	65	75
cost/acre	158	270	363	455	551	651	745	838	938	1044	1137
avgmicexi	2.37	2.31	2.26	2.25	2.22	2.18	2.17	2.14	2.13	2.09	2.05
avgmicseq	3.00	3.01	3.00	3.00	3.00	3.07	3.08	3.09	3.19	3.37	3.37
avgrotagex	44.07	44.63	45.09	46.03	46.47	48.15	49.13	49.18	51.49	52.05	52.32
avgrotagsq	38.72	40.90	43.74	44.18	44.83	46.48	48.05	48.94	49.52	50.11	50.85
ldinnow	14655	20065	29358	36473	41278	46373	50664	55459	59039	62157	65647
ldin10-20	5308	2445	0	0	0	0	0	0	0	0	0
ldin30+	0	0	0	0	0	0	0	0	0	0	0
ldoutnow	8428	9797	10533	12670	13153	13573	14458	14652	14696	15107	15276
ldout10-20	10761	10224	10889	9328	9072	8652	7767	7678	7635	7227	7066
ldout30+	22862	24577	29193	36015	40753	46101	51757	56447	60003	63120	66616

Appendix Table 4a Results for c-trn scenario(continued)

Raw Results for Price set 2 for c-trn

	Price	in $ per ton Carbon realized 2040-2045										
price	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00	21.00	22.00	23.00	24.00
+40carbpay	6762	7111	7405	7675	7868	8105	8261	8357	8624	8764	8977	9159
landpay	71711	75614	78915	81724	83447	85993	87583	88789	91336	92615	94715	96456
carbon+10	1293	1386	1466	1527	1568	1620	1655	1677	1736	1768	1826	1872
carbon+20	3302	3491	3649	3801	3907	4041	4130	4180	4337	4421	4533	4635
carbon+30	5086	5356	5584	5799	5952	6140	6264	6338	6554	6669	6832	6975
carbon+40	6762	7111	7405	7675	7868	8105	8261	8357	8624	8764	8977	9159
carbon+50	5266	5459	5431	5736	5955	6218	6395	6506	6789	6848	6895	7000
carbon+60	3212	3268	3335	3700	3969	4227	4432	4568	4836	4883	4902	4971
carbon+70	1939	2002	2074	2317	2580	2805	3018	3074	3239	3292	3274	3326
netcrb+10	869	939	1017	1064	1096	1150	1185	1208	1270	1301	1356	1392
netcrb+20	2239	2408	2532	2668	2805	2945	3026	3087	3250	3333	3411	3470
netcrb+30	3240	3431	3608	3786	3953	4148	4265	4351	4570	4684	4791	4870
netcrb+40	3574	3740	3949	4155	4337	4488	4591	4652	4812	4950	5098	5198
netcrb+50	2604	2709	2828	3041	3203	3284	3361	3398	3468	3549	3652	3718
netcrb+60	737	713	750	983	1159	1231	1313	1350	1374	1423	1475	1538
netcrb+70	0	0	0	207	341	449	557	537	526	581	593	648
progcost	88	100	111	123	134	146	157	167	181	193	206	220
cost/acre	1226	1317	1407	1503	1603	1697	1792	1882	1983	2082	2180	2279
avgmicexi	2.02	1.97	1.96	1.94	1.92	1.88	1.87	1.85	1.81	1.81	1.80	1.79
avgmicseq	3.35	3.34	3.33	3.33	3.40	3.40	3.40	3.40	3.41	3.41	3.41	3.41
avgrotagex	53.30	53.72	54.23	54.81	55.06	55.12	55.03	55.07	54.72	54.89	55.48	55.31
avgrotagsq	52.17	52.91	53.81	54.80	55.18	55.37	55.54	55.95	56.01	56.07	56.32	56.30
ldinnow	71711	75614	78915	81724	83447	85993	87583	88789	91336	92615	94715	96456
ldin10-20	0	0	0	0	0	0	0	0	0	0	0	0
ldin30+	0	1630	192	0	0	0	0	0	0	0	0	0
ldoutnow	15305	15321	15327	15466	15466	15466	15466	15466	15466	15478	15478	15480
ldout10-20	7042	7034	7039	6901	6901	6908	6907	6907	6907	6895	6895	6894
ldout30+	72673	78201	80064	82711	84416	86955	88546	89762	92313	93620	95713	97438

Appendix Table 4a Results for c-trn scenario(continued)

Raw Results for Price set 3 for c-trn

	Price	in $ per ton Carbon realized 2040-2045										
price	25.00	26.00	27.00	28.00	29.00	30.00	32.00	34.00	36.00	38.00	40.00	45.00
+40carbpay	9264	9525	9665	9754	9972	10115	10381	10614	10804	11063	11219	11701
landpay	97509	100124	101520	102404	104527	105955	108643	111527	113584	116366	118138	123451
carbon+10	1901	1972	2009	2033	2090	2130	2201	2253	2300	2363	2401	2518
carbon+20	4690	4829	4902	4950	5068	5144	5283	5393	5490	5625	5704	5947
carbon+30	7056	7256	7363	7432	7601	7711	7914	8083	8226	8423	8540	8901
carbon+40	9264	9525	9665	9754	9972	10115	10381	10614	10804	11063	11219	11701
carbon+50	7084	7377	7557	7662	7883	8022	8183	8191	8200	8362	8445	8809
carbon+60	5017	5124	5191	5215	5304	5329	5386	5408	5411	5522	5619	5923
carbon+70	3363	3443	3477	3485	3557	3519	3553	3576	3559	3621	3714	3943
netcrb+10	1421	1491	1530	1551	1603	1637	1694	1745	1793	1857	1890	2000
netcrb+20	3518	3643	3713	3730	3781	3833	3937	4013	4099	4228	4287	4544
netcrb+30	4932	5069	5149	5184	5269	5364	5523	5644	5774	5960	6037	6402
netcrb+40	5279	5417	5496	5549	5647	5738	5940	6130	6285	6529	6638	7043
netcrb+50	3798	3930	4043	4095	4188	4267	4426	4490	4535	4753	4842	5175
netcrb+60	1591	1642	1715	1750	1845	1917	2041	2063	2057	2223	2295	2627
netcrb+70	691	669	737	810	929	963	1055	1080	1069	1187	1240	1511
progcost	232	248	261	273	289	303	332	361	389	420	449	527
cost/acre	2375	2474	2570	2667	2767	2864	3058	3236	3424	3613	3798	4265
avgmicexi	1.79	1.76	1.75	1.75	1.74	1.74	1.73	1.72	1.72	1.72	1.72	1.71
avgmicseq	3.40	3.40	3.39	3.39	3.39	3.38	3.37	3.37	3.36	3.36	3.36	3.34
avgrotagex	55.43	55.58	55.80	56.02	55.83	55.89	56.04	55.74	56.06	56.28	56.14	56.15
avgrotagsq	56.41	56.41	56.56	56.70	56.56	56.45	56.66	56.72	56.67	57.44	57.55	56.97
ldinnow	97509	100124	101520	102404	104527	105955	108643	111527	113584	116366	118138	123451
ldin10-20	0	0	0	0	0	0	0	0	0	0	0	0
ldin30+	0	0	0	0	0	0	0	0	0	0	0	0
ldoutnow	15480	15480	15480	15480	15486	15494	15494	15505	15505	15505	15505	15505
ldout10-20	6894	6924	6932	6932	6928	6928	6928	6919	6919	6919	6919	6919
ldout30+	98480	101057	102454	103335	105455	106869	109556	112447	114493	117289	119056	125286

Appendix Table 4a Results for c-trn scenario(continued)

Raw Results for Price set 4 for c-trn

	Price	in $ per ton Carbon realized 2040-2045									
price	50.00	55.00	60.00	65.00	70.00	75.00	80.00	85.00	90.00	95.00	100.00
+40carbpay	12231	12537	13047	13334	13510	13630	13756	13952	14215	14325	14463
landpay	129178	132234	137833	141207	143135	144331	145587	147515	150139	151224	152594
carbon+10	2647	2721	2848	2916	2960	2992	3027	3079	3150	3181	3218
carbon+20	6221	6388	6643	6781	6870	6934	7001	7107	7246	7303	7376
carbon+30	9303	9542	9922	10132	10264	10357	10453	10605	10807	10891	10996
carbon+40	12231	12537	13047	13334	13510	13630	13756	13952	14215	14325	14463
carbon+50	9216	9244	9555	9821	10034	10181	10335	10431	10730	10833	10884
carbon+60	5974	6151	6240	6341	6527	6694	6866	6934	7273	7395	7421
carbon+70	4086	4286	4321	4382	4414	4479	4468	4562	4620	4663	4688
netcrb+10	2117	2192	2318	2383	2417	2446	2461	2517	2574	2603	2640
netcrb+20	4787	4952	5205	5323	5403	5459	5484	5602	5694	5738	5811
netcrb+30	6706	6964	7323	7477	7597	7674	7733	7888	8050	8109	8215
netcrb+40	7482	7805	8288	8511	8661	8786	8878	9072	9309	9395	9533
netcrb+50	5481	5579	5904	6121	6303	6461	6585	6692	6972	7055	7123
netcrb+60	2852	2893	3106	3254	3415	3578	3727	3778	4073	4151	4176
netcrb+70	1680	1731	1878	1996	2055	2182	2261	2313	2515	2569	2587
progcost	612	690	783	867	946	1022	1101	1186	1279	1361	1446
cost/acre	4734	5214	5679	6138	6607	7083	7559	8039	8521	8999	9478
avgmicexi	1.70	1.70	1.70	1.70	1.71	1.71	1.71	1.71	1.71	1.71	1.71
avgmicseq	3.34	3.34	3.33	3.32	3.31	3.31	3.31	3.31	3.31	3.30	3.30
avgrotagex	54.95	55.20	55.07	54.89	54.92	54.88	54.82	54.76	54.57	54.27	54.23
avgrotagsq	56.55	56.76	56.61	56.70	56.70	56.50	56.81	56.95	57.15	57.18	57.22
ldinnow	129178	132234	137833	141207	143135	144331	145587	147515	150139	151224	152594
ldin10-20	0	0	0	0	0	0	0	0	0	0	0
ldin30+	0	0	0	0	0	0	0	0	0	0	0
ldoutnow	15507	15540	15544	15555	15555	15549	15549	15555	15555	15555	15555
ldout10-20	6917	6923	6921	6909	6909	6916	6916	6909	6909	6904	6904
ldout30+	131246	134735	140245	143514	145339	146669	147951	150022	152757	153874	155205

Appendix Table 4b Cost per ton carbon Results

There are many different bases on which this can be computed

Here we compute all almost all of them on a time period by time period basis

Results for Price set 1 for c-trn

	Price	in	in $ per ton Carbon realized 2040-2045									
	0.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00
carbon+10	0.00	11.09	17.67	23.07	29.07	34.32	39.67	45.06	50.35	55.47	60.32	64.50
carbon+20	0.00	3.68	6.27	8.63	10.83	12.88	14.96	17.09	19.13	21.02	22.92	24.82
carbon+30	0.00	2.36	3.99	5.41	6.77	8.11	9.45	10.81	12.14	13.43	14.71	16.01
carbon+40	0.00	2.48	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00
carbon+50	0.00	8.49	7.37	10.69	11.52	12.81	12.25	12.69	13.19	13.69	14.34	15.49
carbon+60	0.00	15.02	17.42	19.59	23.75	27.66	28.75	25.90	24.04	24.60	23.41	24.71
carbon+70		41.63	30.37	32.27	36.18	41.00	42.95	43.08	44.97	46.58	41.70	42.39
netcrb+10		49.67	50.99	51.13	72.10	75.14	78.46	87.86	90.83	93.50	98.27	101.91
netcrb+20	0.00	15.20	14.65	20.49	23.26	25.01	26.66	29.49	31.50	33.33	35.46	37.72
netcrb+30	0.00	9.78	10.19	13.45	14.01	15.74	17.28	19.04	20.76	22.17	23.66	25.38
netcrb+40	0.00	15.21	14.20	13.29	12.67	14.39	15.59	16.94	18.57	19.68	21.13	22.80
netcrb+50	0.00	37.56		147.66	34.44	35.27	30.01	29.00	27.66	28.30	30.22	32.19
netcrb+60								3791.78	125.00	108.53	115.32	112.27
netcrb+70	0.00								1180.72	561.36	692.82	1893.76

Results for Price set 2 for c-trn

	Price	in	in $ per ton Carbon realized 2040-2045									
	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00	21.00	22.00	23.00	24.00
carbon+10	68.00	71.84	75.76	80.44	85.33	90.04	94.82	99.69	104.30	109.06	113.06	117.42
carbon+20	26.62	28.52	30.44	32.31	34.23	36.10	38.01	39.98	41.76	43.61	45.55	47.43
carbon+30	17.28	18.58	19.89	21.18	22.47	23.76	25.06	26.37	27.63	28.91	30.22	31.52
carbon+40	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00	21.00	22.00	23.00	24.00
carbon+50	16.69	18.23	20.45	21.41	22.46	23.46	24.54	25.69	26.67	28.15	29.95	31.41
carbon+60	27.36	30.46	33.30	33.19	33.70	34.52	35.42	36.59	37.45	39.49	42.12	44.22
carbon+70	45.34	49.72	53.56	52.99	51.85	52.01	52.01	54.38	55.92	58.56	63.06	66.09
netcrb+10	101.21	105.99	109.18	115.42	122.08	126.82	132.48	138.39	142.58	148.17	152.30	157.96
netcrb+20	39.26	41.34	43.86	46.02	47.68	49.54	51.87	54.14	55.73	57.85	60.54	63.35
netcrb+30	27.13	29.01	30.79	32.44	33.84	35.17	36.80	38.42	39.63	41.17	43.10	45.14
netcrb+40	24.59	26.62	28.13	29.55	30.85	32.51	34.19	35.93	37.64	38.95	40.50	42.29
netcrb+50	33.75	36.75	39.27	40.38	41.77	44.42	46.69	49.18	52.22	54.33	56.54	59.13
netcrb+60	119.33	139.56	148.03	124.91	115.41	118.49	119.54	123.81	131.79	135.51	139.96	142.89
netcrb+70				594.50	392.67	324.67	281.78	311.29	344.49	331.69	347.91	339.45

Results for Price set 3 for c-trn

	Price in $ per ton Carbon realized 2040-2045											
	25.00	26.00	27.00	28.00	29.00	30.00	32.00	34.00	36.00	38.00	40.00	45.00
carbon+10	121.87	125.62	129.87	134.33	138.35	142.50	150.91	160.19	169.13	177.87	186.93	209.07
carbon+20	49.38	51.29	53.23	55.17	57.05	58.99	62.88	66.92	70.85	74.74	78.68	88.53
carbon+30	32.82	34.13	35.44	36.75	38.04	39.35	41.97	44.65	47.28	49.91	52.55	59.15
carbon+40	25.00	26.00	27.00	28.00	29.00	30.00	32.00	34.00	36.00	38.00	40.00	45.00
carbon+50	32.70	33.57	34.53	35.64	36.69	37.83	40.60	44.06	47.43	50.28	53.14	59.77
carbon+60	46.16	48.33	50.27	52.38	54.52	56.94	61.67	66.73	71.88	76.14	79.86	88.90
carbon+70	68.88	71.93	75.06	78.36	81.30	86.23	93.48	100.92	109.29	116.09	120.82	133.53
netcrb+10	163.03	166.14	170.57	176.07	180.43	185.39	196.13	206.83	216.99	226.38	237.42	263.32
netcrb+20	65.85	67.99	70.28	73.23	76.48	79.17	84.37	89.93	94.89	99.44	104.68	115.88
netcrb+30	46.96	48.86	50.68	52.69	54.88	56.58	60.14	63.94	67.37	70.54	74.34	82.24
netcrb+40	43.87	45.72	47.48	49.22	51.21	52.89	55.92	58.87	61.89	64.39	67.60	74.76
netcrb+50	60.99	63.01	64.55	66.70	69.05	71.11	75.05	80.37	85.77	88.45	92.67	101.74
netcrb+60	145.61	150.85	152.14	156.07	156.74	158.28	162.79	174.97	189.08	189.08	195.54	200.46
netcrb+70	335.25	370.43	353.89	337.34	311.14	314.99	314.90	334.27	363.88	354.18	361.81	348.40

Results for Price set 4 for c-trn

	Price in $ per ton Carbon realized 2040-2045										
	50.00	55.00	60.00	65.00	70.00	75.00	80.00	85.00	90.00	95.00	100.00
carbon+10	231.00	253.41	274.81	297.22	319.47	341.61	363.60	385.20	406.10	427.83	449.37
carbon+20	98.30	107.94	117.83	127.81	137.65	147.42	157.19	166.87	176.56	186.34	196.08
carbon+30	65.74	72.27	78.90	85.54	92.14	98.71	105.28	111.83	118.39	124.96	131.53
carbon+40	50.00	55.00	60.00	65.00	70.00	75.00	80.00	85.00	90.00	95.00	100.00
carbon+50	66.36	74.59	81.93	88.25	94.25	100.41	106.48	113.69	119.23	125.63	132.88
carbon+60	102.37	112.09	125.45	136.68	144.89	152.71	160.27	171.04	175.90	184.03	194.89
carbon+70	149.65	160.89	181.17	197.81	214.23	228.23	246.34	259.95	276.94	291.85	308.48
netcrb+10	288.86	314.55	337.70	363.64	391.20	417.88	447.24	471.16	497.10	522.92	547.83
netcrb+20	127.74	139.23	150.39	162.83	175.05	187.26	200.66	211.69	224.69	237.19	248.90
netcrb+30	91.19	99.01	106.89	115.91	124.48	133.22	142.31	150.35	158.93	167.84	176.06
netcrb+40	81.74	88.34	94.45	101.84	109.19	116.36	123.96	130.73	137.43	144.85	151.71
netcrb+50	111.58	123.59	132.59	141.59	150.04	158.23	167.11	177.21	183.51	192.90	203.05
netcrb+60	214.46	238.33	252.04	266.32	276.94	285.74	295.32	313.92	314.10	327.87	346.29
netcrb+70	363.90	398.24	416.75	434.27	460.19	468.53	486.81	512.73	508.76	529.66	559.10

Appendix Table 4c Land moving into the sequestration program by region

Price in $ per ton Carbon

Price	PNWE	ne	LS	CB	SE	SC	RM	PSW
2	0	2008	550	0	0	7153	0	0
3	0	1781	4151	0	0	7960	0	0
4	0	702	10107	0	0	9948	1714	0
5	0	0	13720	0	0	11448	1714	0
6	0	0	16189	0	0	13124	1714	0
7	0	0	19017	0	245	14549	1714	0
8	0	730	21118	0	238	14641	1714	0
9	0	2066	22807	0	881	15574	1714	0
10	0	2503	23289	0	1527	17546	1714	0
11	0	2820	23289	0	2293	18119	1714	0
12	0	3637	23289	746	2376	18911	1714	0
13	0	5004	23289	3518	3058	20125	1714	0
14	0	6010	23289	5931	3058	20593	1714	0
15	0	6548	23289	8260	3058	21020	1714	0
16	0	8379	23289	8260	3010	21908	1714	0
17	0	9585	23289	8260	3010	22426	1714	0
18	0	10380	23289	8260	3010	23777	1714	269
19	0	11277	23289	8260	3010	24469	1714	269
20	129	12064	23289	8260	3010	24587	1714	269
21	129	12639	23289	8260	3010	26559	1714	269
22	129	12639	23289	8260	2998	27839	1714	269
23	129	12639	23289	10283	2998	27917	1714	269
24	127	12660	23289	11259	2998	28660	1714	269
25	127	12660	23289	12155	3149	28665	1714	269
26	127	12666	23289	14505	3466	28607	1714	269
27	127	12722	23289	15729	3584	28606	1714	269
28	127	12735	23289	16476	3622	28691	1714	269
29	127	12735	23289	18019	3743	29146	1712	269
30	127	12735	23289	19387	3812	29137	1704	269
32	127	12735	23289	21782	4011	29110	1825	269
34	116	12735	23289	22949	4089	29102	3473	269
36	116	12735	23289	24206	4126	29310	4028	269
38	116	12735	23289	25741	4464	29594	4652	269
40	116	12735	23289	26598	4794	29594	5237	269
45	116	12678	23289	29746	5002	29965	6881	269
50	116	12678	23289	32850	5279	30779	8411	269
55	116	12678	23289	34208	5127	32163	8843	269
60	116	12678	23289	38035	5147	32270	10484	269
65	116	12678	23289	39898	5077	32288	12036	269
70	116	12678	23289	41180	5200	32293	12554	269
75	116	12678	23289	42176	5339	32354	12560	269
80	116	12678	23289	43309	5444	32373	12560	269
85	116	12678	23289	44847	5582	32624	12554	269
90	116	12678	23289	47234	5818	32624	12554	269
95	116	12678	23289	48367	5771	32624	12554	269
100	116	12678	23289	49622	5886	32624	12554	269

Appendix Table 5a Results for c-h-bsldt scenario

Basis for land transfer	Payments made for sequestered land based on carbon in 30 years (MMT)
Harvesting Assumption	Harvest can occur at any time on sequestered land
Land Transfer to Ag Assumption	No land transfers can occur beyond those in base model

Raw Results for Price set 1 for c-h-bsldt

Price	in $ per ton Carbon realized 2040-2045										
price	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00
+40carbpay	776	1067	1676	1913	2308	2436	2498	2691	3075	3371	3731
landpay	10342	12272	19334	22464	26971	28520	29381	30559	35146	38600	42399
carbon+10	147	178	309	349	421	445	455	485	563	635	716
carbon+20	445	529	850	964	1170	1238	1269	1368	1572	1739	1919
carbon+30	693	822	1293	1473	1782	1883	1931	2084	2384	2620	2890
carbon+40	663	1067	1676	1913	2308	2436	2498	2691	3075	3371	3731
carbon+50	197	291	452	510	770	863	881	1025	1423	1759	1908
carbon+60	112	166	239	311	407	450	456	526	634	743	813
carbon+70	43	88	163	233	303	347	347	397	421	483	559
netcrb+10	79	117	192	225	299	321	325	360	434	493	578
netcrb+20	176	294	431	533	715	792	811	920	1111	1271	1428
netcrb+30	250	389	477	598	862	961	994	1100	1373	1525	1746
netcrb+40	162	233	282	391	656	714	746	837	1088	1223	1445
netcrb+50	162	159	199	321	578	597	608	681	902	1079	1301
netcrb+60	51	21	84	238	520	529	547	595	838	1003	1240
netcrb+70	37	22	50	215	507	530	559	649	914	1139	1411
progcost	2	3	7	10	14	17	20	24	31	37	45
cost/acre	150	261	347	426	513	598	680	793	875	961	1056
avgmicexi	2.38	2.35	2.30	2.26	2.23	2.20	2.19	2.17	2.12	2.08	2.04
avgmicseq	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.50	3.47	3.45	3.43
avgrotagex	43.96	44.34	44.17	43.75	44.62	44.90	44.88	44.98	46.20	46.75	46.85
avgrotagsq	38.16	38.21	46.41	45.52	46.63	46.93	46.68	47.47	49.02	49.71	49.59
ldinnow	12925	14929	19334	22464	26971	28520	29381	30559	35146	38600	42399
ldin10-20	5856	5211	0	0	0	0	0	0	0	0	0
ldin30+	1121	267	2241	2241	641	0	0	0	0	0	0
ldoutnow	6543	6543	6543	6543	6543	6543	6543	6543	6543	6543	6543
ldout10-20	10653	10653	10653	10653	10653	10653	10653	10653	10653	10653	10653
ldout30+	24412	24412	24412	24412	24412	24412	24412	24412	24412	24412	24412

Appendix Table 5a Results for c-h-bsldt scenario(continued)

Raw Results for Price set 2 for c-h-bsldt

Price in $ per ton Carbon realized 2040-2045												
price	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00	21.00	22.00	23.00	24.00
+40carbpay	4135	4415	4630	5009	5259	5513	5756	6009	6167	6327	6526	6722
landpay	46754	49286	51535	55471	57897	60424	62888	65883	67644	69129	70966	72837
carbon+10	806	856	895	989	1042	1092	1145	1210	1247	1282	1324	1363
carbon+20	2115	2246	2346	2547	2675	2791	2909	3035	3118	3209	3321	3416
carbon+30	3190	3396	3556	3848	4038	4222	4402	4591	4712	4839	4997	5142
carbon+40	4135	4415	4630	5009	5259	5513	5756	6009	6167	6327	6526	6722
carbon+50	2117	2459	2590	2956	3202	3535	3841	4076	4264	4476	4704	4958
carbon+60	897	1224	1274	1340	1398	1475	1511	1584	1746	1957	2224	2535
carbon+70	619	887	904	913	924	932	968	952	1048	1103	1219	1401
netcrb+10	672	729	756	850	898	942	984	1031	1060	1094	1137	1179
netcrb+20	1567	1657	1731	1914	2027	2124	2214	2286	2361	2469	2592	2691
netcrb+30	1918	2044	2152	2306	2430	2572	2708	2788	2902	3055	3238	3383
netcrb+40	1671	1806	1942	2011	2140	2344	2495	2596	2694	2824	2963	3084
netcrb+50	1554	1704	1874	1970	2106	2370	2536	2690	2757	2860	2933	3006
netcrb+60	1491	1638	1852	2027	2191	2423	2612	2802	2887	2979	3047	3137
netcrb+70	1654	1814	2066	2260	2396	2667	2763	2933	3011	3119	3224	3352
progcost	54	62	69	80	89	99	109	120	130	139	150	161
cost/acre	1150	1254	1348	1445	1544	1642	1739	1824	1914	2014	2115	2215
avgmicexi	2.01	1.99	1.98	1.93	1.91	1.90	1.88	1.86	1.83	1.81	1.78	1.75
avgmicseq	3.40	3.46	3.48	3.47	3.46	3.45	3.44	3.42	3.42	3.43	3.44	3.44
avgrotagex	47.07	47.00	47.01	46.86	46.91	46.83	47.68	47.61	47.57	47.81	48.27	48.32
avgrotagsq	49.23	48.84	48.53	48.39	48.24	47.86	48.39	48.72	48.78	49.00	49.12	49.02
ldinnow	46754	49286	51535	55471	57898	60424	62888	65883	67644	69129	70966	72837
ldin10-20	0	0	0	0	0	0	0	0	0	0	0	0
ldin30+	0	0	0	0	0	0	0	0	0	0	0	0
ldoutnow	6543	6543	6543	6543	6543	6543	6543	6543	6543	6543	6543	6543
ldout10-20	10653	10653	10653	10653	10653	10653	10653	10653	10653	10653	10653	10653
ldout30+	24412	24412	24412	24412	24412	24412	24412	24412	24412	24412	24412	24412

Appendix Table 5a Results for c-h-bsldt scenario(continued)

Raw Results for Price set 3 for c-h-bsldt

Price in $ per ton Carbon realized 2040-2045												
price	25.00	26.00	27.00	28.00	29.00	30.00	32.00	34.00	36.00	38.00	40.00	45.00
+40carbpay	6829	6873	6949	7039	7156	7334	7613	7875	8104	8289	8370	8486
landpay	73854	74266	74973	75837	76963	78685	81384	83947	86170	87930	88678	89738
carbon+10	1384	1394	1410	1427	1450	1483	1536	1583	1625	1662	1679	1705
carbon+20	3471	3496	3536	3578	3635	3715	3843	3955	4057	4149	4195	4264
carbon+30	5224	5259	5318	5384	5470	5598	5801	5985	6150	6288	6352	6447
carbon+40	6829	6873	6949	7039	7156	7334	7613	7875	8104	8289	8370	8486
carbon+50	5093	5148	5249	5369	5496	5759	6056	6354	6652	6892	6996	7064
carbon+60	2674	2733	2818	2875	2965	3190	3577	3952	4250	4568	4676	4781
carbon+70	1452	1483	1530	1606	1754	1962	2096	2290	2691	2974	2984	3131
netcrb+10	1199	1209	1226	1243	1282	1306	1359	1407	1451	1488	1505	1533
netcrb+20	2746	2747	2782	2821	2906	2933	3058	3143	3239	3321	3367	3437
netcrb+30	3450	3463	3503	3549	3650	3723	3906	4033	4181	4301	4364	4456
netcrb+40	3163	3179	3232	3288	3398	3509	3762	3964	4167	4319	4387	4492
netcrb+50	3091	3116	3180	3258	3375	3532	3826	4096	4357	4546	4617	4685
netcrb+60	3227	3266	3344	3416	3534	3720	4050	4357	4652	4892	4938	5027
netcrb+70	3463	3515	3625	3668	3764	3946	4246	4578	4884	5209	5279	5415
progcost	171	179	188	197	208	220	244	268	292	315	335	382
cost/acre	2312	2406	2503	2599	2696	2796	2993	3190	3386	3582	3775	4255
avgmicexi	1.74	1.73	1.72	1.71	1.69	1.70	1.70	1.70	1.69	1.69	1.68	1.67
avgmicseq	3.44	3.44	3.44	3.44	3.44	3.43	3.42	3.41	3.41	3.41	3.41	3.42
avgrotagex	48.40	48.51	48.64	49.04	49.59	49.07	49.90	50.35	50.19	49.95	49.99	49.83
avgrotagsq	49.12	49.17	49.18	49.25	49.56	49.33	50.40	51.05	50.92	50.45	50.28	50.05
ldinnow	73854	74266	74973	75837	76963	78685	81384	83947	86170	87930	88678	89738
ldin10-20	0	0	0	0	0	0	0	0	0	0	0	0
ldin30+	0	0	0	0	0	0	0	0	0	0	0	0
ldoutnow	6543	6543	6543	6543	6543	6543	6543	6543	6543	6543	6543	6543
ldout10-20	10653	10653	10653	10653	10653	10653	10653	10653	10653	10653	10653	10653
ldout30+	24412	24412	24412	24412	24412	24412	24412	24412	24412	24412	24412	24412

Appendix Table 5a Results for c-h-bsldt scenario(continued)

Raw Results for Price set 4 for c-h-bsldt

Price in $ per ton Carbon realized 2040-2045											
price	50.00	55.00	60.00	65.00	70.00	75.00	80.00	85.00	90.00	95.00	100.00
+40carbpay	8835	9310	9838	10212	10494	10813	11039	11251	11403	11577	11775
landpay	93200	97948	103255	107000	109771	112933	115183	117314	118852	120583	122575
carbon+10	1792	1919	2062	2163	2237	2324	2386	2443	2484	2533	2583
carbon+20	4460	4714	4992	5191	5343	5512	5632	5745	5825	5916	6023
carbon+30	6723	7090	7495	7782	8001	8246	8419	8582	8699	8832	8985
carbon+40	8835	9310	9838	10212	10494	10813	11039	11251	11403	11577	11775
carbon+50	7464	7933	8561	8806	8983	9120	9409	9653	9837	9854	9988
carbon+60	5111	5578	6369	6563	6691	6784	7125	7428	7662	7678	7903
carbon+70	3370	3487	4456	4432	4509	4725	4840	5224	5466	5452	5563
netcrb+10	1621	1723	1833	1904	1958	2001	2061	2121	2164	2215	2265
netcrb+20	3620	3791	3968	4138	4266	4383	4503	4610	4677	4753	4860
netcrb+30	4710	4912	5119	5328	5501	5652	5820	5967	6060	6164	6314
netcrb+40	4775	5031	5294	5544	5701	5905	6108	6298	6386	6535	6728
netcrb+50	4988	5310	5616	5947	6227	6507	6760	7007	7115	7252	7461
netcrb+60	5337	5709	6088	6407	6709	7098	7323	7578	7697	7845	8067
netcrb+70	5707	6025	6547	7011	7405	7851	8086	8386	8470	8580	8834
progcost	442	512	590	664	735	811	883	956	1026	1100	1177
cost/acre	4740	5228	5717	6204	6692	7181	7667	8152	8635	9121	9606
avgmicexi	1.65	1.64	1.61	1.62	1.62	1.63	1.63	1.63	1.63	1.63	1.64
avgmicseq	3.42	3.41	3.39	3.38	3.38	3.37	3.36	3.36	3.35	3.35	3.35
avgrotagex	50.61	50.01	49.84	48.88	49.57	49.54	48.98	48.85	48.78	47.82	47.42
avgrotagsq	50.93	50.92	51.88	50.93	51.46	51.61	51.13	52.47	52.33	52.22	51.57
ldinnow	93200	97948	103255	107000	109771	112933	115183	117314	118852	120583	122575
ldin10-20	0	0	0	0	0	0	0	0	0	0	0
ldin30+	0	0	0	0	0	0	0	0	0	0	0
ldoutnow	6543	6543	6543	6543	6543	6543	6543	6543	6543	6543	6543
ldout10-20	10653	10653	10653	10653	10653	10653	10653	10653	10653	10653	10653
ldout30+	24412	24412	24412	24412	24412	24412	24412	24412	24412	24412	24412

Appendix Table 5b Cost per ton carbon Results
There are many different bases on which this can be computed
Here we compute all almost all of them on a time period by time period basis

Results for Price set 1 for c-h-bsldt

	Price	in	in $ per ton Carbon realized 2040-2045									
	0.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00
carbon+10	0.00	10.56	17.97	21.72	27.44	32.90	38.31	43.92	49.92	54.61	58.45	62.53
carbon+20	0.00	3.49	6.06	7.89	9.92	11.83	13.78	15.75	17.70	19.55	21.33	23.33
carbon+30	0.00	2.24	3.89	5.18	6.50	7.77	9.06	10.35	11.62	12.90	14.16	15.49
carbon+40	0.00	2.34	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00
carbon+50	0.00	7.89	10.99	14.84	18.77	17.97	19.77	22.69	23.62	21.60	21.08	23.47
carbon+60	0.00	13.84	19.28	28.05	30.73	34.00	37.87	43.80	46.03	48.51	49.90	55.09
carbon+70	0.00	36.41	36.57	41.26	41.00	45.76	49.21	57.52	61.04	73.00	76.73	80.11
netcrb+10		19.71	27.31	34.85	42.47	46.31	53.14	61.41	67.32	70.79	75.30	77.41
netcrb+20	0.00	8.82	10.89	15.55	17.96	19.37	21.52	24.64	26.34	27.67	29.17	31.35
netcrb+30	0.00	6.21	8.23	14.05	16.01	16.06	17.74	20.11	22.02	22.40	24.31	25.65
netcrb+40		9.58	13.72	23.81	24.44	21.11	23.88	26.78	28.94	28.25	30.32	30.99
netcrb+50	0.00	9.59	20.10	33.71	29.83	23.96	28.57	32.88	35.58	34.10	34.36	34.43
netcrb+60	0.00	30.57	154.65	79.53	40.14	26.61	32.26	36.56	40.72	36.70	36.96	36.11
netcrb+70	0.00	42.11	146.78	133.03	44.54	27.30	32.20	35.78	37.34	33.65	32.57	31.74

Results for Price set 2 for c-h-bsldt

	Price	in	in $ per ton Carbon realized 2040-2045									
	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00	21.00	22.00	23.00	24.00
carbon+10	66.71	72.18	77.62	81.07	85.83	90.90	95.52	99.32	103.86	108.61	113.33	118.38
carbon+20	25.42	27.52	29.61	31.46	33.42	35.56	37.60	39.60	41.53	43.38	45.20	47.23
carbon+30	16.85	18.20	19.53	20.83	22.14	23.51	24.85	26.18	27.49	28.76	30.04	31.37
carbon+40	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00	21.00	22.00	23.00	24.00
carbon+50	25.40	25.13	26.81	27.11	27.92	28.08	28.48	29.49	30.37	31.10	31.90	32.53
carbon+60	59.90	50.50	54.49	59.81	63.96	67.27	72.37	75.87	74.17	71.13	67.49	63.64
carbon+70	86.78	69.66	76.79	87.74	96.70	106.51	112.98	126.29	123.52	126.18	123.13	115.11
netcrb+10	80.03	84.73	91.83	94.32	99.59	105.31	111.11	116.60	122.22	127.22	131.97	136.85
netcrb+20	34.30	37.29	40.11	41.87	44.11	46.72	49.40	52.56	54.84	56.37	57.90	59.95
netcrb+30	28.02	30.24	32.27	34.76	36.78	38.58	40.39	43.11	44.63	45.57	46.36	47.68
netcrb+40	32.18	34.23	35.77	39.86	41.77	42.33	43.83	46.30	48.08	49.29	50.65	52.30
netcrb+50	34.60	36.27	37.06	40.68	42.46	41.88	43.12	44.68	46.97	48.67	51.17	53.67
netcrb+60	36.06	37.73	37.49	39.55	40.80	40.95	41.87	42.90	44.86	46.73	49.26	51.42
netcrb+70	32.50	34.08	33.62	35.47	37.31	37.22	39.58	40.97	43.01	44.63	46.55	48.13

Results for Price set 3 for c-h-bsldt

	Price in $ per ton Carbon realized 2040-2045											
	25.00	26.00	27.00	28.00	29.00	30.00	32.00	34.00	36.00	38.00	40.00	45.00
carbon+10	123.32	128.21	133.09	138.13	143.16	148.37	158.65	169.15	179.49	189.51	199.35	223.90
carbon+20	49.19	51.12	53.06	55.08	57.10	59.22	63.39	67.70	71.90	75.91	79.81	89.55
carbon+30	32.68	33.98	35.28	36.61	37.94	39.30	42.00	44.73	47.44	50.09	52.70	59.23
carbon+40	25.00	26.00	27.00	28.00	29.00	30.00	32.00	34.00	36.00	38.00	40.00	45.00
carbon+50	33.52	34.72	35.74	36.71	37.76	38.20	40.23	42.14	43.86	45.70	47.85	54.06
carbon+60	63.84	65.39	66.59	68.54	69.99	68.97	68.10	67.75	68.64	68.96	71.60	79.87
carbon+70	117.59	120.47	122.60	122.75	118.32	112.15	116.24	116.90	108.42	105.90	112.20	121.97
netcrb+10	142.34	147.78	153.07	158.57	161.88	168.49	179.29	190.36	201.10	211.68	222.38	249.01
netcrb+20	62.18	65.05	67.44	69.87	71.41	75.01	79.68	85.18	90.08	94.84	99.43	111.10
netcrb+30	49.48	51.60	53.57	55.53	56.86	59.09	62.38	66.39	69.78	73.23	76.71	85.69
netcrb+40	53.97	56.22	58.05	59.94	61.07	62.71	64.76	67.54	70.01	72.93	76.31	85.00
netcrb+50	55.23	57.35	58.99	60.50	61.50	62.30	63.68	65.37	66.95	69.29	72.50	81.50
netcrb+60	52.91	54.72	56.11	57.69	58.73	59.15	60.15	61.45	62.72	64.39	67.80	75.97
netcrb+70	49.30	50.84	51.76	53.73	55.14	55.76	57.37	58.49	59.74	60.47	63.42	70.52

Results for Price set 4 for c-h-bsldt

	Price in $ per ton Carbon realized 2040-2045										
	50.00	55.00	60.00	65.00	70.00	75.00	80.00	85.00	90.00	95.00	100.00
carbon+10	246.44	266.85	286.31	306.90	328.32	348.93	370.14	391.46	413.20	434.28	455.80
carbon+20	99.04	108.63	118.24	127.87	137.47	147.12	156.81	166.47	176.17	185.89	195.51
carbon+30	65.70	72.22	78.76	85.29	91.81	98.35	104.90	111.43	117.98	124.53	131.05
carbon+40	50.00	55.00	60.00	65.00	70.00	75.00	80.00	85.00	90.00	95.00	100.00
carbon+50	59.18	64.54	68.95	75.38	81.78	88.92	93.86	99.07	104.33	111.62	117.89
carbon+60	86.44	91.79	92.68	101.15	109.79	119.54	123.95	128.74	133.94	143.24	149.00
carbon+70	131.07	146.84	132.47	149.77	162.93	171.64	182.45	183.07	187.75	201.74	211.67
netcrb+10	272.45	297.21	322.06	348.58	375.24	405.22	428.43	450.80	474.18	496.64	519.79
netcrb+20	122.02	135.06	148.77	160.40	172.20	185.02	196.13	207.42	219.44	231.37	242.29
netcrb+30	93.79	104.25	115.31	124.60	133.54	143.49	151.74	160.25	169.34	178.44	186.48
netcrb+40	92.50	101.77	111.49	119.74	128.84	137.33	144.58	151.85	160.72	168.29	175.02
netcrb+50	88.56	96.43	105.11	111.63	117.96	124.62	130.63	136.47	144.24	151.66	157.82
netcrb+60	82.76	89.69	96.97	103.61	109.49	114.26	120.59	126.20	133.33	140.19	145.96
netcrb+70	77.40	84.99	90.17	94.68	99.19	103.29	109.21	114.03	121.17	128.19	133.29

Appendix Table 5c Land moving into the sequestration program by region

Price in $ per ton Carbon

Price	PNWE	ne	LS	CB	SE	SC	RM	PSW
2	0	2103	803	0	0	6954	0	0
3	0	2748	1308	0	0	7808	0	0
4	0	5718	1308	0	0	8660	497	0
5	0	5718	1308	0	0	10574	1714	0
6	0	7318	1308	0	0	13480	1714	0
7	0	7959	1308	0	0	13907	1714	0
8	0	7959	1308	0	169	13907	1714	0
9	0	8436	1308	0	870	13907	1714	0
10	0	11002	1308	0	1531	15067	1714	0
11	0	11859	1308	0	2022	16251	1714	0
12	0	11859	3078	148	2217	17126	1714	0
13	0	11859	5085	1523	2699	17617	1714	0
14	0	11859	6327	2013	3046	18070	1714	0
15	0	11859	7086	2521	4027	18070	1714	0
16	0	11859	7746	4525	4027	19342	1714	0
17	0	11859	8823	4865	4027	20352	1714	0
18	0	11859	10720	5171	4027	20675	1714	0
19	0	11859	11963	5895	4027	21172	1714	0
20	0	11859	12549	7742	4027	21335	1714	287
21	129	11859	12873	8266	4027	21948	1714	287
22	129	11859	13156	8266	4027	23149	1714	287
23	129	11859	13535	8266	4027	24608	1714	287
24	129	11859	14734	8266	4027	25280	1714	287
25	129	11859	15235	8266	4027	25796	1714	287
26	129	11859	15343	8266	4027	26099	1714	287
27	129	11859	15593	8266	4027	26557	1714	287
28	129	11859	16238	8266	4027	26776	1714	287
29	129	11859	16995	8266	4027	27145	1714	287
30	129	11859	18423	8266	4027	27439	1714	287
32	129	11859	20557	8266	4027	28004	1714	287
34	129	11859	23017	8266	4027	28107	1714	287
36	129	11859	24923	8266	4027	28424	1714	287
38	129	11859	25956	8266	4027	29151	1714	287
40	129	11859	26108	8266	4027	29746	1714	287
45	129	11859	26108	8266	4027	30807	1714	287
50	129	11859	26108	9815	4971	31775	1714	287
55	129	12239	26108	13579	5267	32082	1714	287
60	129	12668	26108	18211	5562	32035	1714	287
65	129	12669	26108	21452	6049	32051	1714	287
70	129	12670	26108	23590	6279	32453	1714	287
75	129	12670	26108	26477	6435	32570	1714	287
80	129	12672	26108	28572	6594	32566	1714	287
85	129	12672	26108	30361	6967	32535	1714	287
90	129	12842	26108	31612	7073	32545	1714	287
95	129	12672	26108	33450	7267	32414	1714	287
100	129	13140	26108	34683	7310	32663	1714	287

Appendix Table 6a Results for c-h-noldt scenario

Basis for land transfer	Payments made for sequestered land based on carbon in 30 years (MMT)
Harvesting Assumption	Harvest can occur at any time on sequestered land
Land Transfer to Ag Assumption	No land transfers back to ag can occur

Raw Results for Price set 1 for c-h-noldt

Price	in $ per ton Carbon realized 2040-2045										
price	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00
+40carbpay	259	472	703	817	933	1081	1195	1425	1656	1935	2119
landpay	3027	5434	8611	9982	11323	13025	13601	16056	18497	21352	23425
carbon+10	42	78	119	138	157	180	197	234	271	318	352
carbon+20	135	230	332	388	448	523	583	701	817	947	1030
carbon+30	207	361	526	614	705	822	913	1095	1275	1482	1616
carbon+40	259	472	703	817	933	1081	1195	1425	1656	1935	2119
carbon+50	91	126	285	327	368	420	489	577	659	733	846
carbon+60	58	70	166	190	213	233	296	353	393	441	453
carbon+70	37	33	83	89	105	123	162	201	232	260	258
netcrb+10	165	151	181	194	206	245	270	294	325	370	400
netcrb+20	375	418	463	509	558	625	693	799	885	1013	1090
netcrb+30	549	623	730	788	857	943	1029	1122	1232	1360	1469
netcrb+40	542	618	747	802	835	900	971	1014	1131	1238	1377
netcrb+50	460	603	686	737	778	871	939	1001	1075	1186	1268
netcrb+60	467	667	789	855	907	1030	1074	1189	1256	1363	1451
netcrb+70	1269	1467	1627	1723	1813	1896	1890	2032	2084	2281	2365
progcost	0	1	3	4	6	8	10	13	17	21	25
cost/acre	171	261	326	409	495	581	703	799	895	997	1085
avgmicexi	2.38	2.36	2.33	2.31	2.29	2.28	2.27	2.23	2.19	2.15	2.12
avgmicseq	3.00	3.00	3.00	3.00	3.00	3.00	3.68	3.73	3.75	3.71	3.65
avgrotagex	43.43	43.99	43.55	43.64	43.86	44.22	44.51	44.33	45.11	44.83	45.37
avgrotagsq	35.16	39.27	42.28	41.84	40.97	40.29	40.13	39.40	39.24	38.11	40.58
ldinnow	3027	5434	8611	9982	11323	13025	13601	16056	18497	21352	23425

Appendix Table 6a Results for c-h-noldt scenario(continued)

Raw Results for Price set 2 for c-h-noldt

	Price	in $ per ton Carbon realized 2040-2045										
price	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00	21.00	22.00	23.00	24.00
+40carbpay	2452	2782	3127	3335	3628	4018	4237	4547	4705	4907	5016	5126
landpay	26765	30470	34220	36431	39811	43756	46073	49686	51361	53672	54816	55953
carbon+10	419	483	546	590	646	729	774	845	886	932	957	982
carbon+20	1205	1375	1536	1642	1783	1969	2075	2239	2324	2417	2468	2523
carbon+30	1873	2128	2382	2540	2759	3047	3210	3449	3572	3718	3798	3880
carbon+40	2452	2782	3127	3335	3628	4018	4237	4547	4705	4907	5016	5126
carbon+50	998	1277	1588	1763	1940	2143	2268	2555	2705	2892	2993	3170
carbon+60	512	577	657	737	835	983	1021	1143	1239	1345	1386	1437
carbon+70	298	332	382	463	545	679	649	721	768	806	799	806
netcrb+10	468	533	587	629	675	756	799	870	907	949	968	993
netcrb+20	1252	1407	1532	1604	1704	1863	1965	2131	2175	2205	2225	2255
netcrb+30	1651	1897	2059	2126	2242	2484	2558	2686	2742	2794	2832	2875
netcrb+40	1547	1792	1949	2025	2170	2478	2530	2582	2648	2731	2782	2827
netcrb+50	1418	1558	1764	1906	2106	2415	2481	2563	2654	2788	2846	2891
netcrb+60	1541	1670	1860	2005	2178	2531	2601	2695	2835	3028	3128	3243
netcrb+70	2438	2626	2854	2947	3090	3503	3595	3777	3929	4123	4216	4315
progcost	32	39	47	53	62	72	81	91	99	108	115	123
cost/acre	1191	1278	1371	1465	1549	1653	1747	1830	1924	2011	2105	2199
avgmicexi	2.07	2.01	1.98	1.97	1.95	1.93	1.89	1.84	1.84	1.83	1.83	1.82
avgmicseq	3.63	3.61	3.58	3.57	3.56	3.53	3.52	3.52	3.51	3.49	3.48	3.47
avgrotagex	45.39	46.32	46.23	46.16	46.20	46.44	46.62	46.49	46.37	46.31	46.15	45.77
avgrotagsq	41.29	44.31	44.22	44.02	43.95	44.22	44.22	44.38	44.38	44.51	44.37	43.97
ldinnow	26765	30470	34220	36431	39811	43756	46073	49686	51361	53672	54816	55953

Appendix Table 6a Results for c-h-noldt scenario(continued)

Raw Results for Price set 3 for c-h-noldt

Price in $ per ton Carbon realized 2040-2045												
price	25.00	26.00	27.00	28.00	29.00	30.00	32.00	34.00	36.00	38.00	40.00	45.00
+40carbpay	5388	5670	5894	6059	6173	6345	6574	6729	6838	6915	7075	7590
landpay	58709	61586	63998	65557	66594	68192	70338	71813	72830	73560	75088	79985
carbon+10	1042	1103	1158	1192	1217	1254	1301	1332	1355	1370	1402	1505
carbon+20	2647	2780	2893	2977	3045	3141	3262	3340	3399	3438	3517	3774
carbon+30	4072	4279	4447	4573	4665	4801	4978	5095	5180	5238	5358	5746
carbon+40	5388	5670	5894	6059	6173	6345	6574	6729	6838	6915	7075	7590
carbon+50	3475	3747	4010	4183	4319	4542	4838	5088	5261	5373	5598	6116
carbon+60	1501	1561	1625	1763	1911	2068	2386	2575	2641	2757	2972	3653
carbon+70	792	825	880	975	1033	1158	1327	1410	1437	1588	1819	2291
netcrb+10	1053	1104	1159	1193	1218	1255	1303	1353	1370	1380	1410	1523
netcrb+20	2374	2482	2608	2692	2753	2845	2934	3035	3091	3136	3217	3447
netcrb+30	3080	3270	3424	3569	3649	3773	3885	4037	4097	4153	4270	4595
netcrb+40	3012	3215	3355	3455	3498	3613	3760	3916	4020	4107	4249	4689
netcrb+50	3055	3272	3398	3447	3446	3550	3749	3869	4000	4131	4334	4821
netcrb+60	3475	3634	3716	3788	3771	3890	4124	4264	4398	4518	4741	5238
netcrb+70	4490	4602	4696	4802	4792	4925	5144	5277	5415	5511	5722	6162
progcost	135	147	159	170	179	190	210	229	246	263	283	342
cost/acre	2294	2394	2487	2588	2688	2791	2991	3186	3380	3572	3769	4270
avgmicexi	1.80	1.78	1.75	1.73	1.70	1.68	1.66	1.64	1.64	1.63	1.63	1.62
avgmicseq	3.45	3.44	3.43	3.43	3.44	3.44	3.45	3.45	3.45	3.45	3.45	3.45
avgrotagex	45.89	46.34	47.09	47.21	47.39	47.36	47.37	48.04	48.98	49.42	49.56	49.47
avgrotagsq	44.03	44.44	45.34	45.30	45.35	45.39	45.28	45.41	45.50	45.91	46.31	47.26
ldinnow	58709	61586	63998	65557	66594	68192	70338	71813	72830	73560	75088	79985

Appendix Table 6a Results for c-h-noldt scenario(continued)

Raw Results for Price set 4 for c-h-noldt

Price	in $ per ton Carbon realized 2040-2045										
price	50.00	55.00	60.00	65.00	70.00	75.00	80.00	85.00	90.00	95.00	100.00
+40carbpay	7749	8297	8794	9162	9442	9612	9825	10083	10382	10600	10830
landpay	81727	87522	92464	96192	99058	100765	102828	105477	108444	110578	112861
carbon+10	1540	1673	1803	1899	1975	2021	2082	2149	2230	2288	2351
carbon+20	3861	4156	4423	4619	4768	4857	4968	5106	5264	5382	5503
carbon+30	5870	6296	6680	6964	7179	7308	7471	7670	7899	8068	8245
carbon+40	7749	8297	8794	9162	9442	9612	9825	10083	10382	10600	10830
carbon+50	6282	6910	7446	7978	8233	8308	8209	8295	8637	8905	9172
carbon+60	3882	4380	4956	5625	5875	5929	5725	5755	6153	6484	6812
carbon+70	2357	2589	3054	3488	3584	3672	3486	3515	3714	4103	4466
netcrb+10	1559	1684	1793	1875	1929	1963	1973	2024	2105	2161	2219
netcrb+20	3539	3741	3934	4100	4233	4306	4370	4478	4646	4749	4851
netcrb+30	4731	5036	5283	5453	5625	5695	5766	5922	6162	6308	6466
netcrb+40	4844	5210	5504	5689	5920	6020	6067	6266	6558	6724	6875
netcrb+50	5028	5529	5933	6147	6446	6582	6701	7015	7339	7533	7722
netcrb+60	5477	6097	6600	6765	7139	7285	7451	7836	8191	8425	8608
netcrb+70	6522	7151	7625	7940	8413	8593	8828	9230	9571	9858	10030
progcost	387	456	528	596	661	721	786	857	934	1007	1083
cost/acre	4741	5214	5707	6191	6673	7154	7644	8126	8616	9106	9596
avgmicexi	1.61	1.61	1.61	1.59	1.59	1.59	1.59	1.60	1.60	1.60	1.60
avgmicseq	3.44	3.42	3.40	3.39	3.38	3.38	3.37	3.37	3.36	3.36	3.35
avgrotagex	49.87	49.52	50.01	49.53	49.17	49.28	49.41	48.98	48.59	48.48	48.56
avgrotagsq	48.16	48.71	50.71	50.71	50.81	50.91	51.08	50.68	50.13	50.98	51.95
ldinnow	81727	87522	92464	96192	99058	100765	102828	105477	108444	110578	112861

Appendix Table 6b Cost per ton carbon Results
There are many different bases on which this can be computed
Here we compute all almost all of them on a time period by time period basis

Results for Price set 1 for c-h-noldt

	Price	in	in $ per ton Carbon realized 2040-2045									
	0.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00
carbon+10		0.00	18.12	23.61	29.58	35.75	41.99	48.45	54.86	61.11	66.90	72.31
carbon+20		0.00	6.17	8.46	10.54	12.51	14.45	16.41	18.29	20.27	22.48	24.70
carbon+30		0.00	3.93	5.34	6.66	7.94	9.21	10.47	11.71	12.99	14.36	15.74
carbon+40		0.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00
carbon+50		0.00	11.24	9.86	12.48	15.21	18.02	19.55	22.21	25.12	29.04	30.07
carbon+60		0.00	20.35	16.98	21.49	26.28	32.44	32.30	36.34	42.10	48.26	56.08
carbon+70		0.00	42.68	33.99	45.98	53.38	61.33	58.98	63.95	71.38	81.73	98.50
netcrb+10	0.00	0.00	9.38	15.57	21.09	27.15	30.92	35.42	43.60	51.01	57.57	63.55
netcrb+20	0.00	0.00	3.39	6.07	8.02	10.03	12.10	13.79	16.05	18.71	21.02	23.33
netcrb+30	0.00	0.00	2.28	3.85	5.19	6.53	8.02	9.29	11.43	13.44	15.65	17.31
netcrb+40	0.00	0.00	2.29	3.76	5.10	6.71	8.40	9.84	12.64	14.63	17.19	18.46
netcrb+50	0.00	0.00	2.35	4.10	5.54	7.20	8.69	10.18	12.81	15.41	17.95	20.05
netcrb+60	0.00	0.00	2.13	3.56	4.78	6.18	7.35	8.90	10.78	13.19	15.62	17.53
netcrb+70	0.00	0.00	0.97	1.73	2.37	3.09	3.99	5.06	6.31	7.94	9.33	10.75

Results for Price set 2 for c-h-noldt

	Price	in	in $ per ton Carbon realized 2040-2045									
	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00	21.00	22.00	23.00	24.00
carbon+10	76.02	80.59	85.96	90.45	95.45	99.22	104.05	107.57	111.52	115.80	120.60	125.28
carbon+20	26.46	28.32	30.53	32.49	34.59	36.73	38.79	40.62	42.52	44.66	46.74	48.77
carbon+30	17.02	18.31	19.69	21.01	22.35	23.74	25.08	26.36	27.66	29.03	30.38	31.71
carbon+40	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00	21.00	22.00	23.00	24.00
carbon+50	31.93	30.51	29.54	30.26	31.79	33.75	35.50	35.59	36.52	37.33	38.55	38.81
carbon+60	62.23	67.53	71.40	72.43	73.90	73.58	78.88	79.55	79.72	80.23	83.25	85.62
carbon+70	107.01	117.29	122.84	115.19	113.15	106.54	124.12	126.07	128.64	133.93	144.32	152.55
netcrb+10	68.16	73.08	79.84	84.80	91.32	95.68	100.70	104.54	108.89	113.73	119.20	123.86
netcrb+20	25.46	27.69	30.62	33.26	36.19	38.82	40.98	42.67	45.43	48.96	51.85	54.56
netcrb+30	19.30	20.53	22.78	25.09	27.50	29.12	31.47	33.85	36.03	38.64	40.73	42.79
netcrb+40	20.60	21.74	24.06	26.35	28.42	29.18	31.82	35.21	37.31	39.54	41.47	43.52
netcrb+50	22.47	25.01	26.58	27.99	29.28	29.95	32.44	35.48	37.23	38.72	40.54	42.55
netcrb+60	20.68	23.33	25.22	26.61	28.32	28.57	30.95	33.75	34.85	35.65	36.89	37.94
netcrb+70	13.07	14.83	16.43	18.10	19.96	20.65	22.39	24.07	25.15	26.19	27.37	28.51

Results for Price set 3 for c-h-noldt

	Price in $ per ton Carbon realized 2040-2045											
	25.00	26.00	27.00	28.00	29.00	30.00	32.00	34.00	36.00	38.00	40.00	45.00
carbon+10	129.29	133.72	137.40	142.38	147.09	151.82	161.65	171.74	181.66	191.73	201.83	226.99
carbon+20	50.89	53.02	55.02	56.99	58.79	60.61	64.48	68.50	72.42	76.43	80.47	90.49
carbon+30	33.08	34.45	35.79	37.10	38.37	39.65	42.25	44.90	47.52	50.16	52.82	59.45
carbon+40	25.00	26.00	27.00	28.00	29.00	30.00	32.00	34.00	36.00	38.00	40.00	45.00
carbon+50	38.76	39.35	39.69	40.56	41.44	41.91	43.48	44.96	46.79	48.90	50.56	55.84
carbon+60	89.77	94.46	97.96	96.26	93.69	92.06	88.17	88.86	93.21	95.32	95.22	93.50
carbon+70	170.11	178.74	180.87	174.02	173.30	164.41	158.50	162.27	171.25	165.43	155.62	149.07
netcrb+10	127.97	133.57	137.33	142.21	146.98	151.71	161.50	169.09	179.66	190.36	200.67	224.31
netcrb+20	56.74	59.41	61.02	63.02	65.03	66.90	71.69	75.37	79.63	83.78	87.98	99.09
netcrb+30	43.73	45.08	46.48	47.54	49.06	50.46	54.15	56.68	60.09	63.27	66.28	74.33
netcrb+40	44.72	45.86	47.44	49.11	51.17	52.68	55.94	58.42	61.24	63.98	66.60	72.85
netcrb+50	44.09	45.06	46.84	49.21	51.95	53.62	56.12	59.13	61.55	63.61	65.30	70.84
netcrb+60	38.77	40.57	42.83	44.79	47.47	48.94	51.01	53.66	55.97	58.16	59.70	65.20
netcrb+70	30.00	32.04	33.89	35.33	37.36	38.65	40.89	43.35	45.46	47.68	49.46	55.43

Results for Price set 4 for c-h-noldt

	Price in $ per ton Carbon realized 2040-2045										
	50.00	55.00	60.00	65.00	70.00	75.00	80.00	85.00	90.00	95.00	100.00
carbon+10	251.54	272.73	292.64	313.56	334.74	356.68	377.60	398.79	418.91	440.15	460.70
carbon+20	100.35	109.81	119.31	128.91	138.64	148.43	158.21	167.86	177.50	187.10	196.78
carbon+30	66.01	72.49	78.99	85.52	92.07	98.64	105.21	111.74	118.29	124.80	131.35
carbon+40	50.00	55.00	60.00	65.00	70.00	75.00	80.00	85.00	90.00	95.00	100.00
carbon+50	61.67	66.05	70.86	74.64	80.28	86.77	95.74	103.33	108.18	113.07	118.07
carbon+60	99.80	104.18	106.46	105.86	112.51	121.58	137.28	148.94	151.84	155.30	158.99
carbon+70	164.39	176.25	172.79	170.72	184.44	196.30	225.46	243.87	251.57	245.41	242.49
netcrb+10	248.56	271.06	294.24	317.67	342.64	367.17	398.45	423.48	443.86	465.87	488.10
netcrb+20	109.47	121.98	134.11	145.23	156.14	167.42	179.86	191.40	201.12	212.05	223.26
netcrb+30	81.90	90.61	99.87	109.20	117.50	126.59	136.31	144.73	151.64	159.64	167.49
netcrb+40	79.98	87.60	95.87	104.68	111.64	119.76	129.55	136.78	142.48	149.76	157.53
netcrb+50	77.06	82.54	88.93	96.88	102.54	109.53	117.29	122.18	127.31	133.67	140.24
netcrb+60	70.75	74.85	79.94	88.02	92.59	98.96	105.48	109.37	114.06	119.52	125.81
netcrb+70	59.41	63.81	69.20	75.00	78.57	83.89	89.03	92.86	97.63	102.15	107.98

Appendix Table 6c Land moving into the sequestration program by region

Price in $ per ton Carbon

Price	PNWE	ne	LS	CB	SE	SC	RM	PSW
2	0	0	0	0	0	3027	0	0
3	0	0	1601	0	0	3833	0	0
4	0	0	2307	0	0	4665	1640	0
5	0	0	2600	0	0	5582	1800	0
6	0	0	2600	0	0	6923	1800	0
7	0	0	2600	0	0	8625	1800	0
8	0	0	2600	0	0	9201	1800	0
9	0	0	2600	0	0	11656	1800	0
10	0	0	2906	0	0	13791	1800	0
11	0	0	4352	0	0	15200	1800	0
12	0	1034	5391	0	0	15200	1800	0
13	0	1669	6384	0	125	16787	1800	0
14	0	3184	6967	0	742	17777	1800	0
15	0	3900	8804	0	1617	18099	1800	0
16	0	3900	9452	517	2138	18624	1800	0
17	0	3900	10500	1146	3834	18631	1800	0
18	0	3900	12763	2110	3865	19318	1800	0
19	0	3900	13756	2569	4373	19675	1800	0
20	0	3900	14047	3864	5200	20475	1800	400
21	0	3900	14246	4838	5200	20977	1800	400
22	300	3900	15280	5803	5200	20990	1800	400
23	300	3900	15911	6266	5200	21039	1800	400
24	300	3900	16373	6731	5200	21248	1800	400
25	300	3900	17744	7942	5200	21423	1800	400
26	300	3900	19417	8774	5200	21796	1800	400
27	300	3900	20130	10200	5200	22068	1800	400
28	300	3900	20908	10200	5200	22849	1800	400
29	300	3900	20916	10200	5200	23879	1800	400
30	300	3900	21307	10200	5200	25085	1800	400
32	300	3900	22128	10200	5200	26411	1800	400
34	300	3900	22977	10200	5200	27036	1800	400
36	300	3900	23298	10200	5200	27732	1800	400
38	300	3900	23701	10200	5200	28060	1800	400
40	300	3900	24610	10200	5200	28679	1800	400
45	300	3900	27400	10200	5200	30785	1800	400
50	300	5468	27400	10200	5200	30959	1800	400
55	300	8890	27400	12114	5200	31418	1800	400
60	300	9596	27400	15636	5234	32098	1800	400
65	300	10184	27400	18207	5639	32262	1800	400
70	300	10547	27400	20542	5969	32100	1800	400
75	300	10547	27400	22146	6194	31977	1800	400
80	300	10144	27400	24560	6260	31964	1800	400
85	300	10658	27400	26379	6563	31977	1800	400
90	300	10658	27400	29090	6781	32015	1800	400
95	300	10658	27400	30683	6916	32421	1800	400
100	300	10658	27400	32839	7018	32446	1800	400