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Erratum to: Quantifying and monetizing potential climate change policy impacts on terrestrial ecosystem carbon storage and wildfires in the United States

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The referenced publication included a methodological error that affects portions of the reported results.

The original publication projected terrestrial ecosystem carbon storage and acreage burned using the MC1 dynamic global vegetation model. Annual projections were made using meteorological data from a number of global circulation models (GCMs) from both a reference (REF) scenario with unconstrained emissions and a stabilization scenario (POL3.7) with a total radiative forcing of 3.7 W/m² by 2100. Projected impacts to terrestrial ecosystem carbon storage were monetized using discounted social cost of carbon (SCC) values, while discounted wildfire response costs were used to monetize the impacts to projected burned acreage.

The original economic estimates for carbon storage were in error because the annual impact of the stabilization scenario on the stock of carbon storage was monetized instead of the impact on the flow of carbon. This error significantly overestimates the impact of the stabilization

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scenario. The difference in the calculation of the impact on flow and stocks of carbon storage is expressed mathematically as follows:

$$Impact\ on\ flow_i = (Pol3.7_i - Pol3.7_{i-1}) - (Ref_i - Ref_{i-1})$$

$$Impact\ on\ stock_i = Pol3.7_i - Ref_i$$

Where i =year of data

Table E-1 presents the results of the analysis after correcting for this error. As a result of the correction, the total discounted value results shift from being expressed in terms of trillions of

Table E-1 POL3.7 impacts on the flow of carbon storage, valuation using the average SCC discounted at 3 %

Decade	IGSM-CAM (WIND=1)	IGSM-CAM (WIND=13)	IGSM-CAM (WIND=14)	IGSM-CAM (WIND=26)	IGSM-CAM (WIND=28)	MIROC	CCSM
Change in terrestrial ecosystem carbon storage (POL3.7 – REF, billions of metric tons)							
2001–2010	(0.3)	1.1	(0.1)	(0.3)	(0.2)	0.0	0.0
2011–2020	0.4	1.1	0.4	1.2	1.8	0.1	0.0
2021–2030	(0.1)	(1.0)	2.4	0.2	(0.9)	0.1	(0.0)
2031–2040	(0.3)	(0.6)	(1.9)	0.1	(1.0)	(0.0)	(0.1)
2041–2050	0.5	0.4	(0.6)	(1.4)	0.1	0.2	(0.1)
2051–2060	0.5	(1.5)	(0.2)	1.4	(1.3)	0.4	0.1
2061–2070	0.7	(1.2)	(0.5)	(3.0)	0.4	0.2	(0.0)
2071–2080	(1.2)	0.5	(0.5)	1.0	(1.4)	0.3	0.1
2081–2090	0.3	(0.8)	0.3	(1.0)	0.5	0.1	0.1
2091–2100	(0.3)	0.4	0.8	1.2	1.6	0.0	0.1
Total	0.3	(1.6)	0.1	(0.6)	(0.5)	1.4	0.2
IGSM-CAM average	(0.5)						
SD	0.8						
Discounted monetized values for projected changes in terrestrial ecosystem carbon storage (POL3.7 – REF, billions US\$ 2005 using the average SCC)							
2001–2010	(\$42)	\$141	(\$8)	(\$37)	(\$26)	\$0	(\$2)
2011–2020	\$49	\$138	\$49	\$155	\$226	\$12	\$2
2021–2030	(\$12)	(\$130)	\$289	\$25	(\$103)	\$8	(\$0)
2031–2040	(\$32)	(\$65)	(\$197)	\$12	(\$111)	(\$2)	(\$8)
2041–2050	\$49	\$36	(\$44)	(\$140)	\$16	\$22	(\$9)
2051–2060	\$45	(\$124)	(\$11)	\$104	(\$105)	\$29	\$4
2061–2070	\$54	(\$76)	(\$29)	(\$199)	\$31	\$12	(\$0)
2071–2080	(\$69)	\$40	(\$28)	\$59	(\$67)	\$17	\$5
2081–2090	\$16	(\$39)	\$16	(\$44)	\$24	\$5	\$4
2091–2100	(\$14)	\$12	\$28	\$45	\$55	(\$0)	\$2
Total	\$44	(\$67)	\$65	(\$20)	(\$61)	\$103	(\$2)
IGSM-CAM average	(\$8)						
SD	\$60						
Totals may not sum due to rounding							

discounted dollars to, generally, tens of billions of discounted dollars. The correction also changes the sign of the cumulative results for the primary climate modeled used (IGSM-CAM). Specifically, the original paper reported a change in carbon storage of -0.9 billion metric tons for the 2001–2100 period ($SD=39.2$ billion metric tons) when comparing POL3.7 to the REF, with a cumulative, discounted (3 %) benefit of global GHG mitigation estimated at \$1.66 trillion (\$2005, $SD=\$2.71$ trillion).¹ With the correction, the corresponding results are -0.5 billion metric tons ($SD=0.8$ billion metric tons) valued at $-\$8$ billion ($SD=\$60$ billion). The sign of monetized results for the other two climate models, MIROC and CCSM, remain the same, but the magnitudes (\$103 billion and $-\$2$ billion, respectively) are much smaller compared to the estimates originally reported (see Table E-1).

This correction also requires replacement of Online Resources #12, and #14.

Finally, the correction affects the results presented in Table 3 of the overview paper for the special issue (Waldhoff et al. 2014),² which should now read (changes shown in **bold**)

Sector and Special Issue Paper Reference	Impact	Benefits of GHG Mitigation (POL 3.7 – REF)				Notes
		2050		2100		
		Physical	Monetary (2005) \$B	Physical	Monetary (2005) \$B	
Ecosystems (Mills et al. 2014a)	Terrestrial carbon storage	80 million fewer metric tons of carbon stored	(19)	26 million fewer metric tons of carbon stored	(11)	2050 and 2100 estimates based on avg. of 2045–2054 and 2095–2104 period, respectively. Avg. of 5 initial conditions in IGSM-CAM per scenario. Monetization based on social value of stored carbon. Cumulative benefits through 2100 are (\$7.62B).

¹ Estimates represent the average of the five initial conditions per emission scenario under the IGSM-CAM climate model.

² Waldhoff S, Martinich J, Sarofim M, DeAngelo B, McFarland J, Jantarasami L, Shouse K, Crimmins A, Ohrel S, Li J (2014) Overview of the special issue: a multi-model framework to achieve consistent evaluation of climate change impacts in the United States. *Climatic Change*. doi:10.1007/s10584-014-1206-0