

Supplement of Biogeosciences, 11, 5057–5071, 2014  
<http://www.biogeosciences.net/11/5057/2014/>  
doi:10.5194/bg-11-5057-2014-supplement  
© Author(s) 2014. CC Attribution 3.0 License.



*Supplement of*

## **Updated estimates of carbon accumulation rates in coastal marsh sediments**

**X. Ouyang and S. Y. Lee**

*Correspondence to:* X. Ouyang (xiaoguang.ouyang@griffithuni.edu.au)

## Supplementary Information (Ouyang & Lee)

We also followed the 'uncertainty propagation' approach used by Donato et al. (2011) to estimate global CAR in salt marshes. In terms of the uncertainty propagation, our global CAR was scaled up to  $40.7 \text{ g C m}^{-2} \text{ yr}^{-1}$ , using data from the extreme low end (5<sup>th</sup> percentile), and to  $753.5 \text{ g C m}^{-2} \text{ yr}^{-1}$ , using data from the extreme high end (95<sup>th</sup> percentile) of all the individual sites in our collated literature. All percentile values were calculated using the 'Frequencies' routine in SPSS version 22. Our area-averaged CAR was  $244.7 \pm 26.1 \text{ g C m}^{-2} \text{ yr}^{-1}$ .

Then we propagated the uncertainty by extrapolating the total global CAR estimates using the lower value of  $22\,000 \text{ km}^2$  (Chmura et al. 2003) and our global areal estimates for salt marshes, i.e.  $41\,657 \text{ km}^2$ . Specifically, the low-end estimate of total global CAR was the combination of the low-end global salt marsh area and 5<sup>th</sup> percentile CAR, while the high-end estimate of total CAR was combined by the high-end global salt marsh area and 95<sup>th</sup> percentile CAR. Total CAR of salt marsh sediments was estimated to be varied between  $0.9 \text{ Tg C yr}^{-1}$  and  $31.4 \text{ Tg C yr}^{-1}$ . Our total CAR  $10.2 \pm 1.1 \text{ Tg C yr}^{-1}$  (calculated using region-specific CAR and regional salt marsh areal extent) lies within this range.

Ideally we could estimate the range of the values calculated using this region-specific method through the same uncertainty propagation approach (i.e. obtaining 5<sup>th</sup> and 95<sup>th</sup> percentile region-specific CAR and area values). However, the number of studies available for obtaining the percentile values were  $<20$  in all but three regions, making the estimation unreliable.

## References

Chmura, G. L., Anisfeld, S. C., Cahoon, D. R., and Lynch, J. C.: Global carbon sequestration in tidal, saline wetland soils, *Global Biogeochem. Cy.*, 17, 1111, 10.1029/2002GB001917, 2003.

Donato, D. C., Kauffman, J. B., Murdiyarso, D., Kurnianto, S., Stidham, M., and Kanninen, M.: Mangroves among the most carbon-rich forests in the tropics, *Nat. Geosci.*, 4, 293-297, 2011.