**Impacts of Drying and Rewetting on the Radiocarbon Signature of Respired CO2 and Implications for Incubating Archived Soils**

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**Key Points:**

· ∆14C of CO2 measured in incubations of archived soils provides additional constraints for soil carbon models

· Air-drying and rewetting soils shifted the ∆14C of respired CO2 by 10 to 20‰ independent of the duration of storage

· The direction and magnitude of the shift in ∆14C of CO2 differed among forest and grassland soils, emphasizing the importance of sampling year and system C dynamics

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