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ARTICLES

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The age distribution of global soil carbon inferred from radiocarbon measurements

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Soil radiocarbon $\Delta^{14}C$ (-244‰)

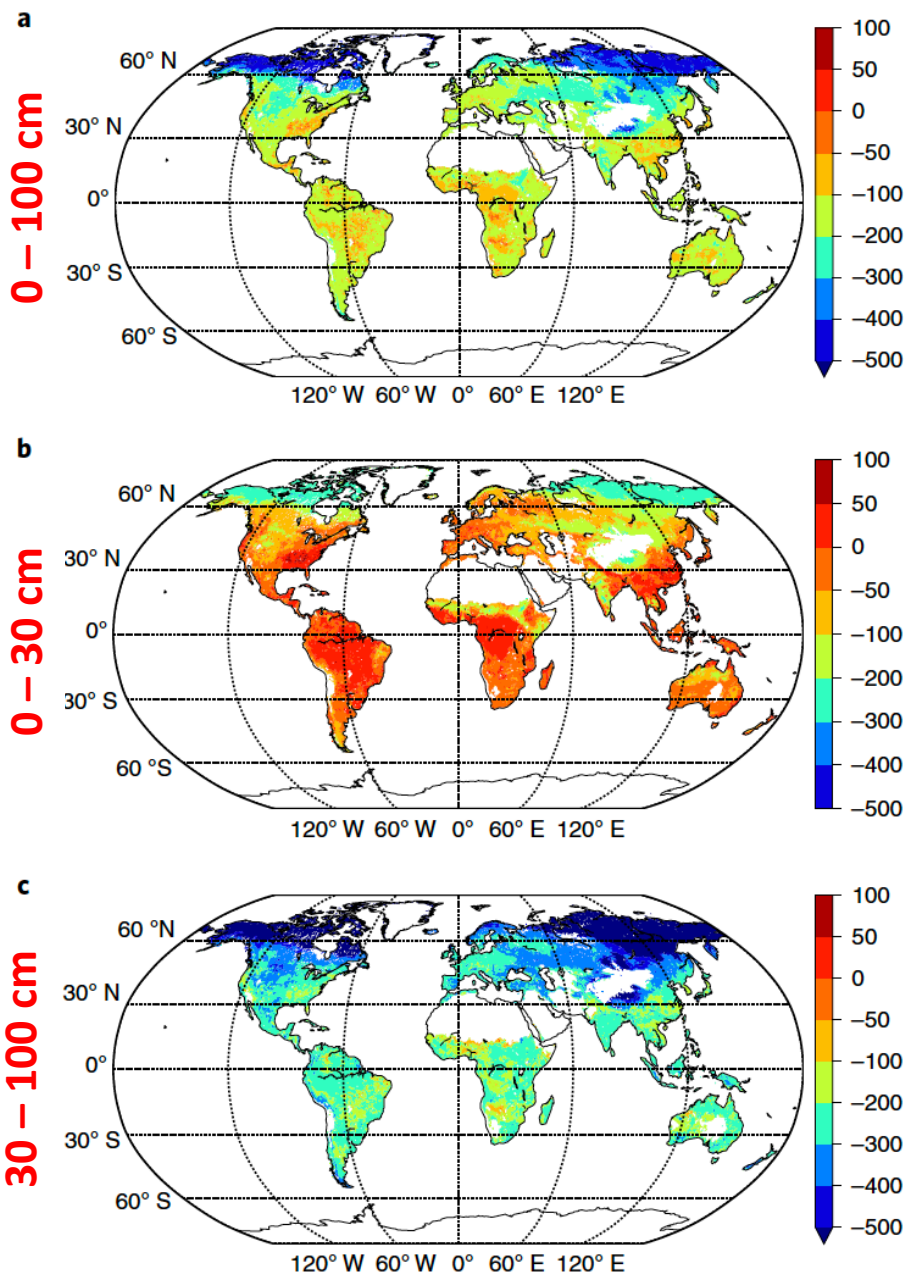
Mean carbon age (4800 yr)

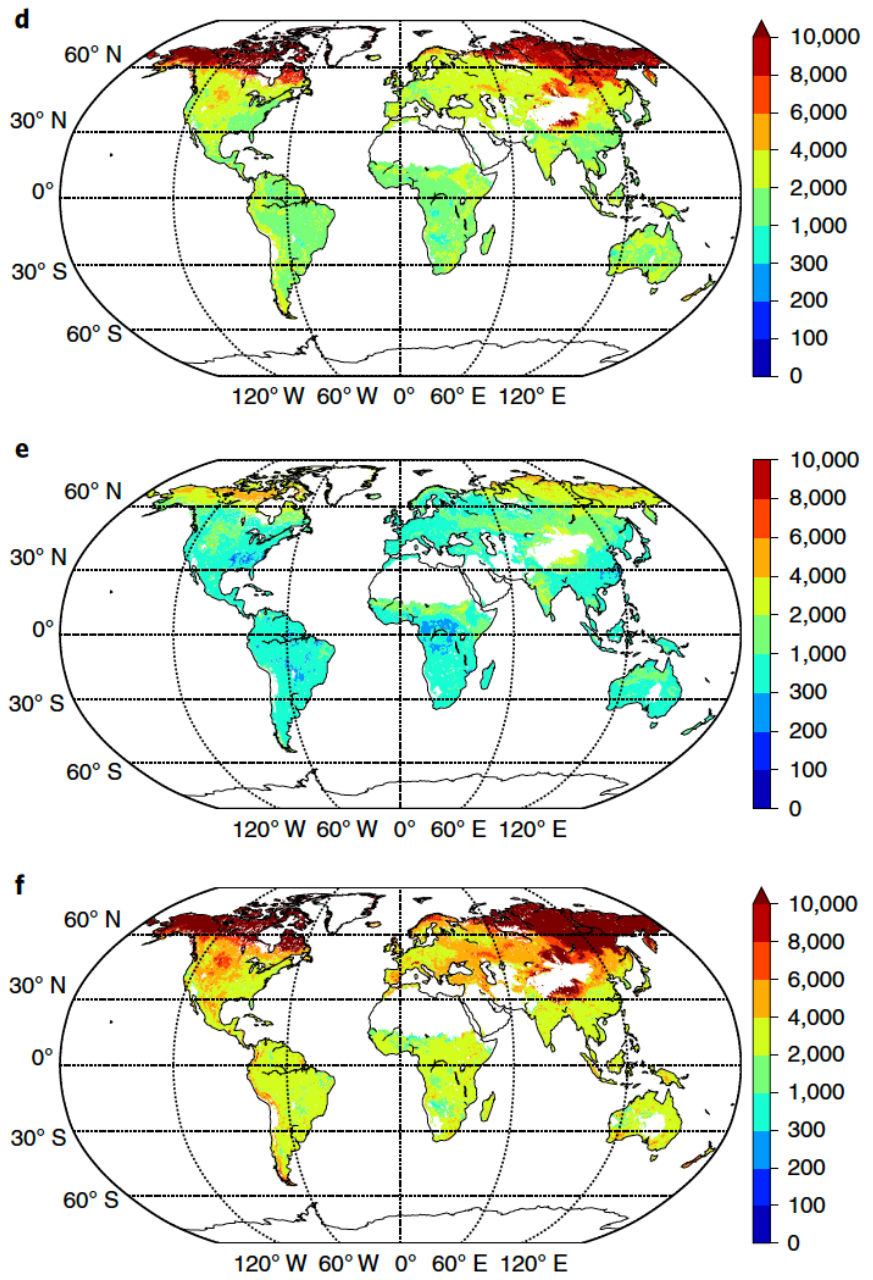
$\Delta^{14}C$ comparison btw data and model

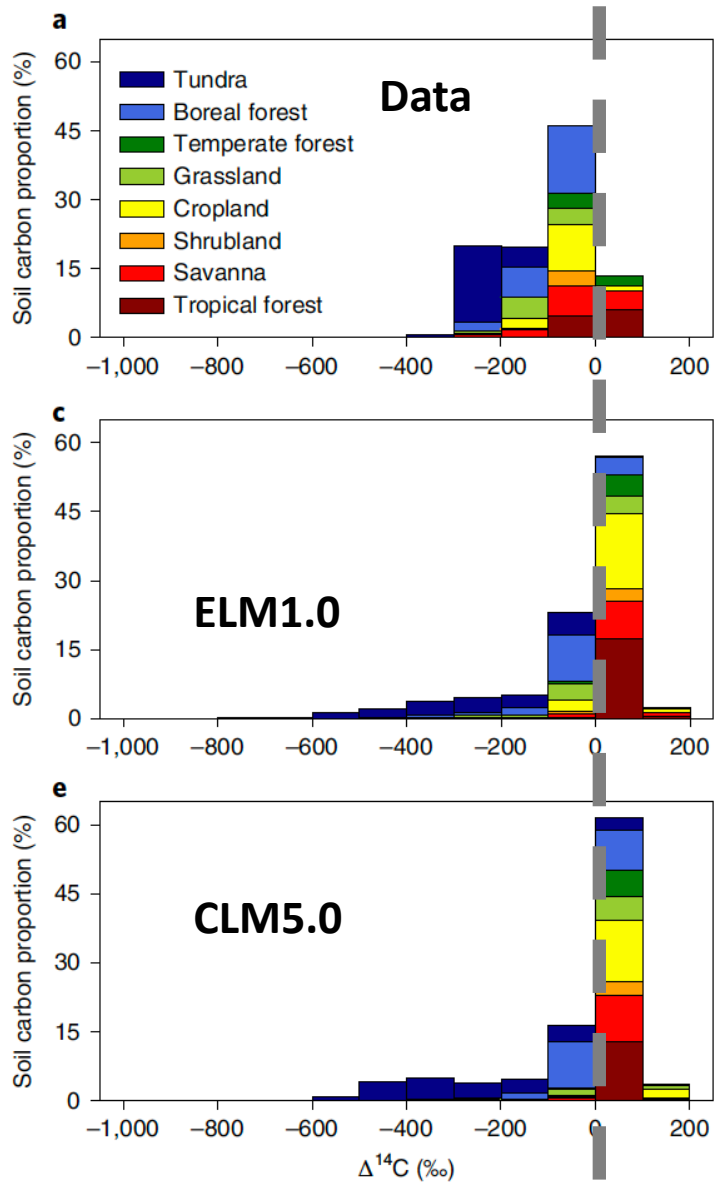
0 – 100 cm

0 – 30 cm

30 – 100 cm

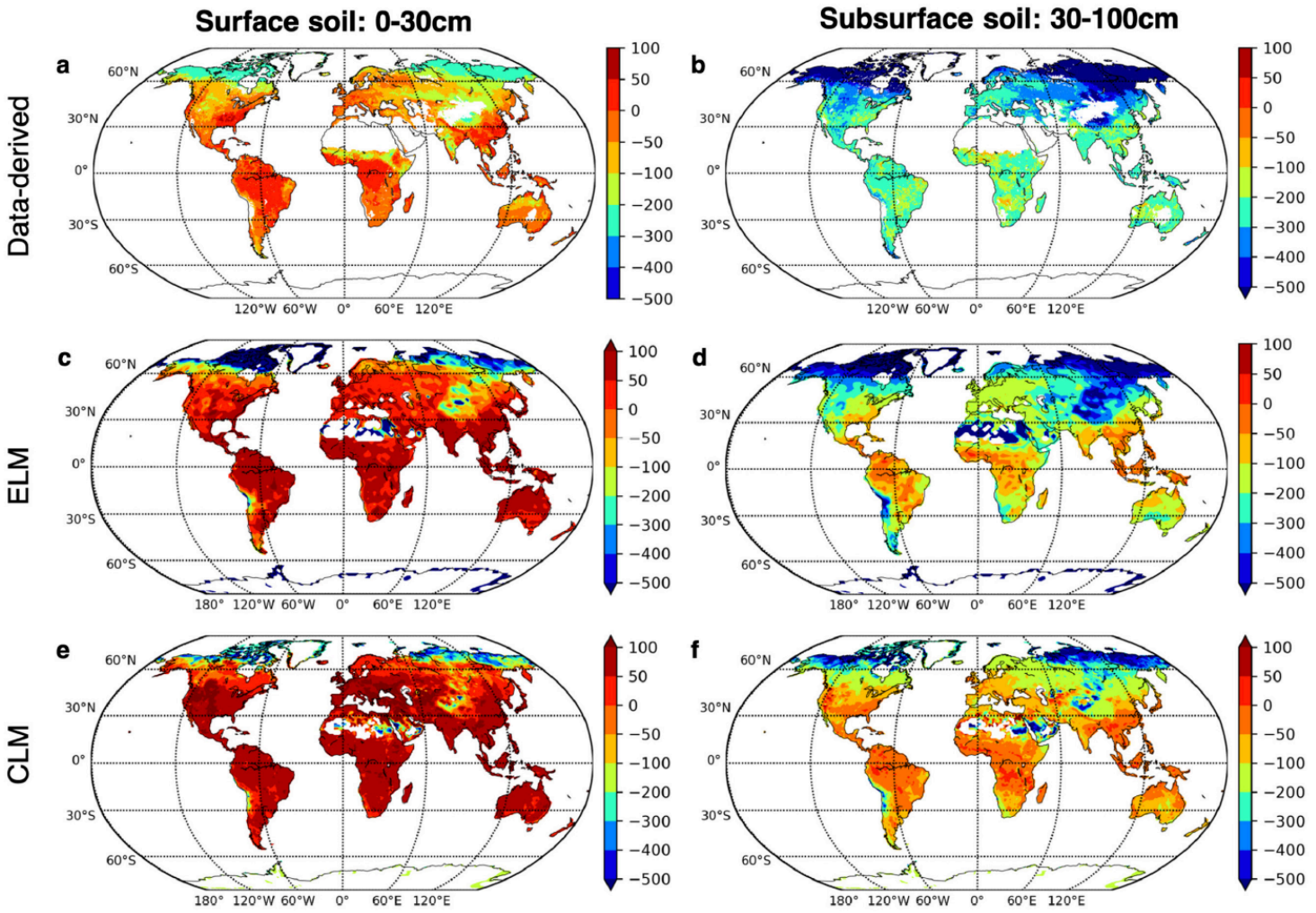




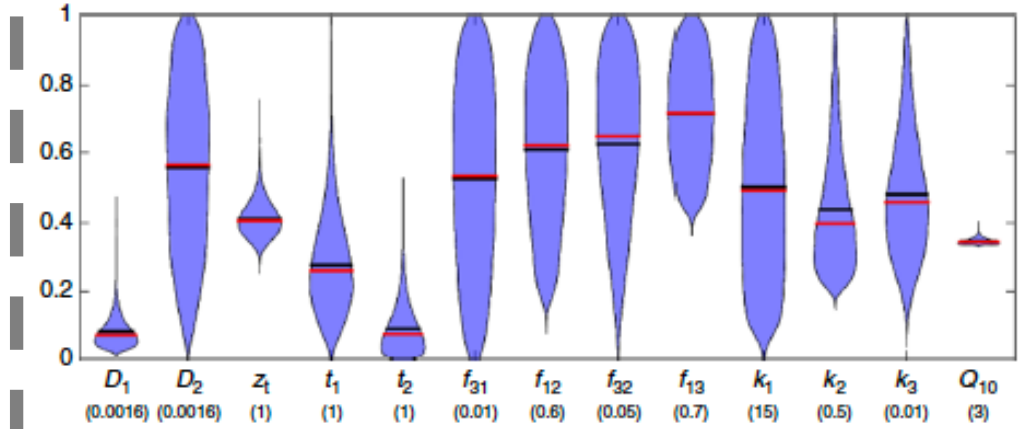


Future research:

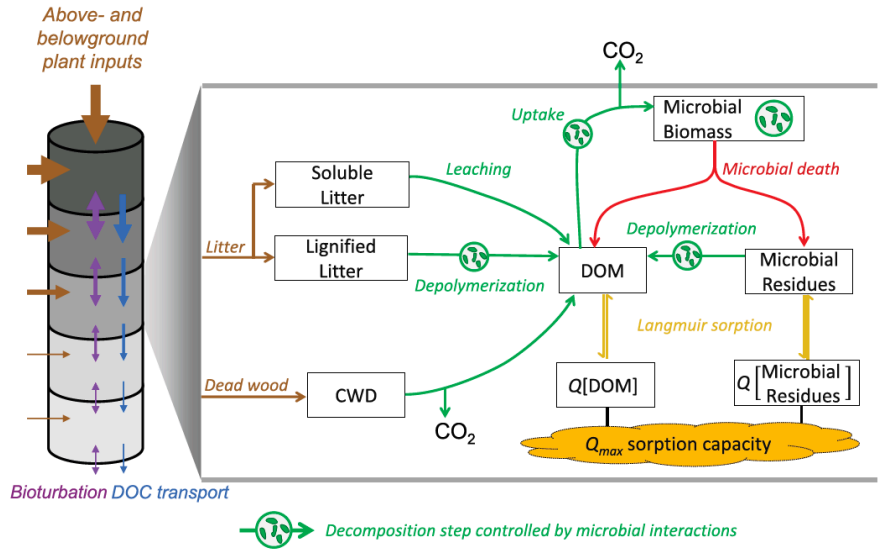
1) Benchmark soil radiocarbon in CMIP6 models
2) Improve soil carbon and radiocarbon predictions in global land models



Shi et al. 2020 Nature Geoscience



Shi et al. 2018 Nature Communications



Ahrens et al. 2020 Soil Biology & Biochemistry

Relationships to white paper

Short Term (3-5 years) Research Goals

- Characterize and evaluate soil dynamics (e.g., decomposition, nutrient cycling, cryoturbation) to better understand distributions of soil organic matter and influences of turnover time using isotope data and advanced tracer methods.
- Conduct simulation experiments using the E3SM modeling framework in support of hypothesis-driven research and organized model intercomparison project (MIPs)