

CESM Cross-Working Group

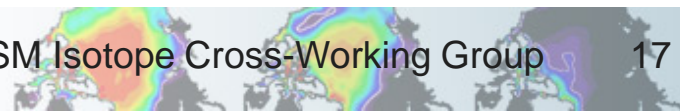
Isotopes

Many uses of Isotopes and Geotracers:

- To infer past climate changes.
- To trace ocean water masses
- To identify source regions of precipitation
- To analyze cloud processes
- To diagnose model biases
- To more directly compare to paleo data
- To make use of new datasets for model validation
- ...

Status of isotopes and geotracers iCESM1

	CAM5	CLM4	Runoff	POP2	OCN- Eco	CICE4	CISM2	CPL7
Water isotopes	✓	Soon	Soon	✓	–	Soon	planned	✓
Carbon ¹⁴ C	planned	✓	<i>prescribed</i>	✓	✓	–	–	planned
¹³ C	planned	✓	<i>prescribed</i>	–	✓	–	–	planned
Pa/Th	–	–	–	In progress	In progress	–	–	–
Nd	–	–	–	In progress	In progress	–	–	–
¹⁴ N, ¹⁵ N	–	–	–	–	✓	–	–	–



1. What important isotopes and geotracers are we missing?

2. CESM1 → CESM2? What? How?

- *CAM5 to CAM5.5*
 - *dynamical core, physics, numerics, advection*
 - *Which convection scheme? Both?*
- *WACCM5 to (WACCM5.5?) WACCM6*
 - *Chemistry coupling?*
- *CLM4 to CLM4.5 to CLM5*
 - *RTM*
- *POP2 to POPx*
 - *free surface*
- *CICE4 to CICE5*
- *CISM2*
- *RTM*
- *BENCHMARKS*



1. CESM CSL pre-CMIP6 community simulations?

- *CESM1 with water and carbon isotopes: Pre-industrial + 20th century + RCP8.5*
- *Bomb spike + tritium + ff?*
- *CAM5-SE with water isotopes at high-resolution*
 - *What are the precip water isotope distributions at high resolution*
 - *How high resolution? ¼ degree? Forecast mode?*