Interactive fire emissions in CESM2

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**Motivation**

- Prescribed fire emissions in CMIP6 are too low for PI conditions (Hamilton et al., 2018)
- Trend in fire emissions is likely unrealistic in CMIP6
- Interactive fire emissions in tune with meteorology in the model

**Basic CESM2.2.0 default setup:**

- PI control simulation runs without land-use
- In 1850, sudden increase in fire C emissions due to unburned carbon accumulation
- Sudden increase in fire C emission
- Drop in temperatures with more fire emissions with the start of the historical simulation

Thanks to Wenfu Tang
Interactive fire emissions in CESM2

- Drop in temperatures with more fire emissions with the start of the historical simulation in previous setup

Thanks to Wenfu Tang
Interactive fire emissions in CESM2: New PI Control Simulation

CESM2.2 setup
• Start in 1750
• Updated wet scavenging
• OASIS ocean emissions (more SO4)
  -> model out of balance

CESM2.2 tuning
• clubb_gamma_coef = 0.30
• dust_emis_fact = 0.65

Sea-ice tuning
• r_snw = 1.6
• dt_mlt = 0.2
• rsnw_mlt = 1000.
Interactive fire emissions in CESM2: New Historical Simulation

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So far it looks good 😊