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What paleofire records can say about the present and future of fire on Earth

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Sedimentary charcoal records typically provide information about variations in wildfire activity over thousands of years, and a few even span millions of years. Such long, continuous measurements of combustion products offer a rare opportunity to understand the response of fire to both rapid and gradual climate forcings, whether from human-caused global warming, volcanic activity, atmosphere-ocean circulation changes, or Milankovitch cycles. Here we use paleofire records from the Global Charcoal Database to demonstrate the dynamic nature of wildfire activity in response to varied forcings, particularly the role that relatively small temperature and precipitation shifts have on patterns of burning across space and time. Paleodata from areas currently experiencing severe wildfires are also examined in order to provide context for events that appear unprecedented in modern times.