Wildfires in the 21st Century under Different Scenarios in CESM2/WACCM6

THE 26th CESM ANNUAL WORKSHOP
Fire cross -WG session

Wenfu Tang
Atmospheric Chemistry Observations and Modeling Lab, NCAR

15 JUNE 2021

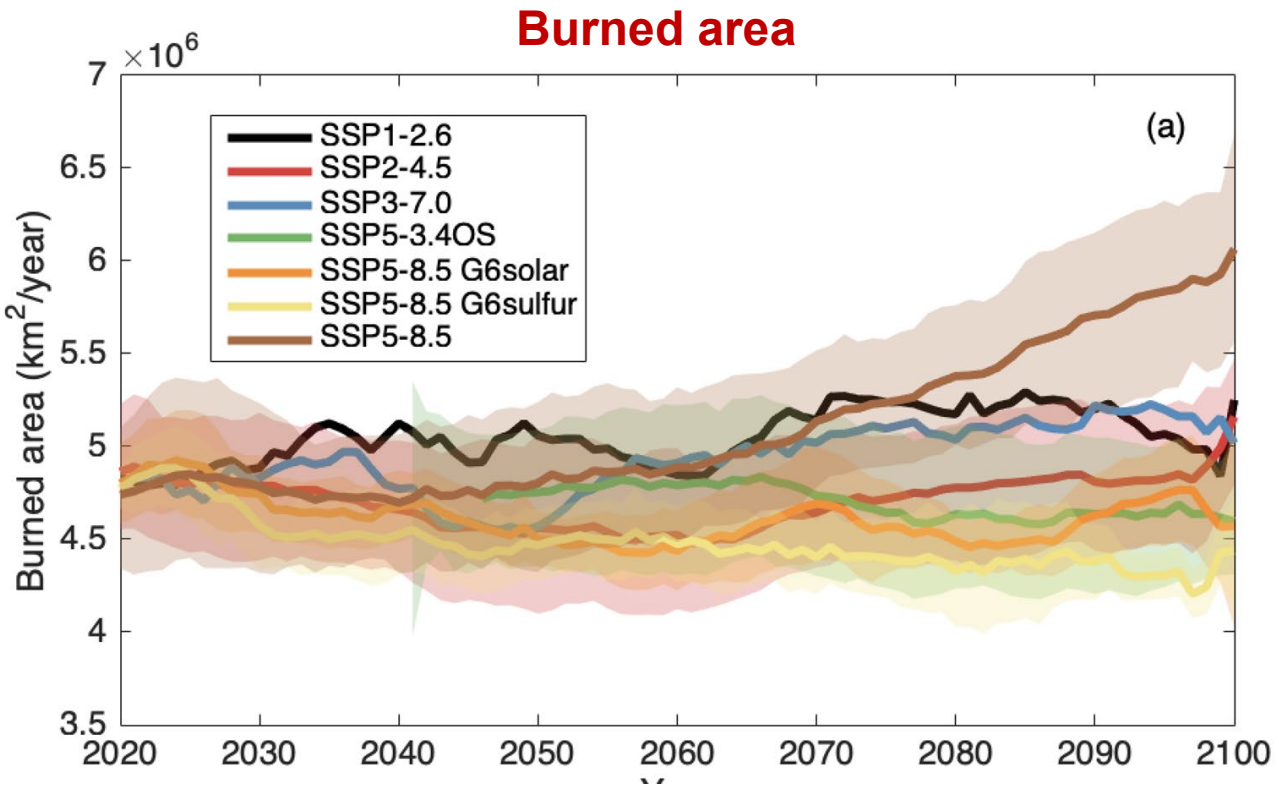
This material is based upon work supported by the National Center for Atmospheric Research, which is a major facility sponsored by the National Science Foundation under Cooperative Agreement No. 1852977.

Scenarios from ScenarioMIP and GeoMIP

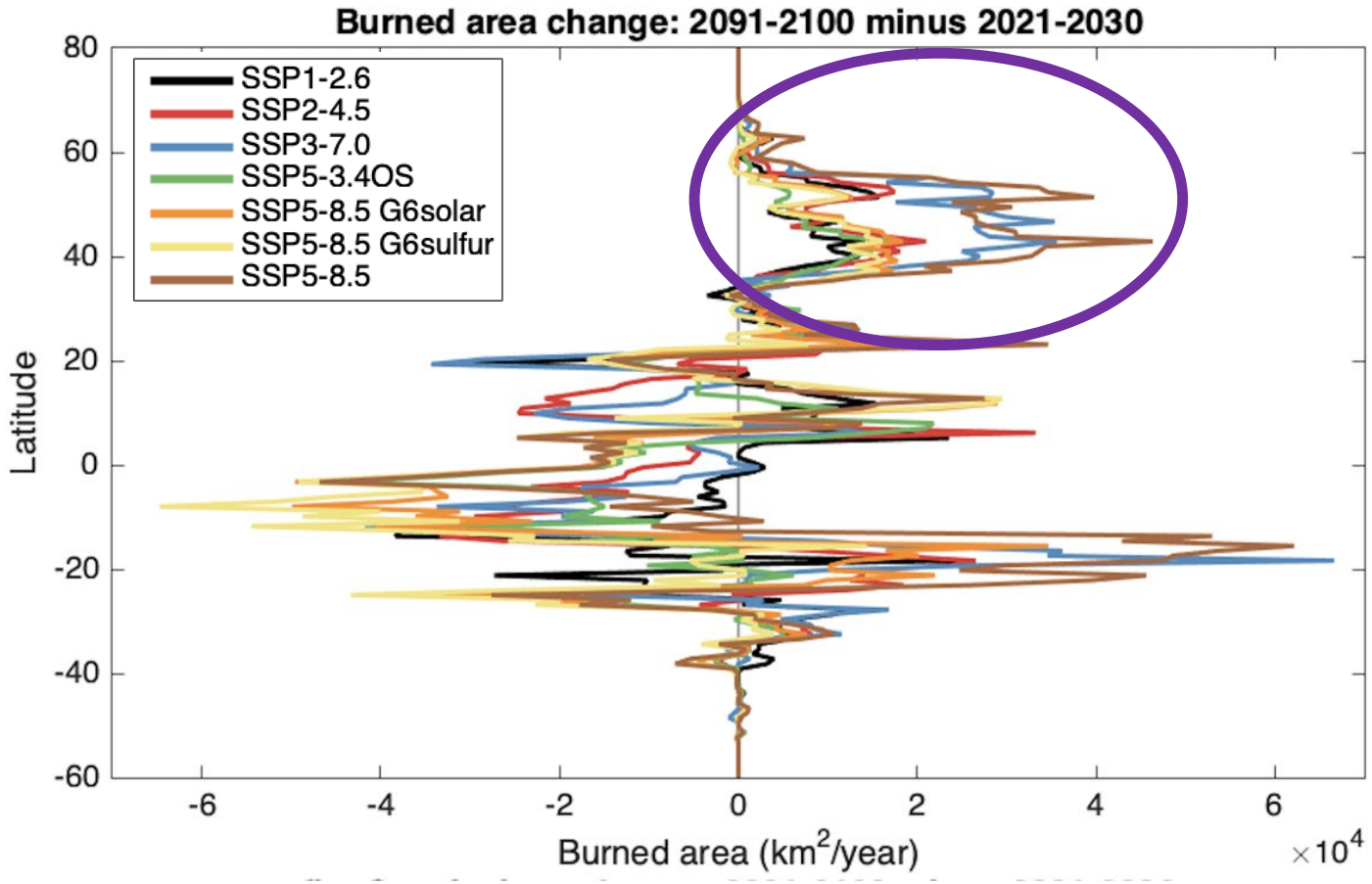
	Scenario	Number of simulations	Start year	End year
sustainable development	SSP1-2.6	1	2015	2100
middle-of-the-road development	SSP2-4.5	5	2015	2100
substantial land use changes	SSP3-7.0	1	2015	2100
unmitigated baseline scenario	SSP5-8.5	5	2015	2100
overshoot scenario	SSP5-3.4OS	5	2040	2100
stratospheric sulfate aerosols	G6Sulfur	2	2015	2100
solar irradiance reduction	G6Solar	2	2015	2100

Global total wildfire burned area for SSP and geoengineering scenarios

The global total wildfire burned area is projected to decrease under the geoengineering and overshoot scenarios, and increase under the other scenarios.

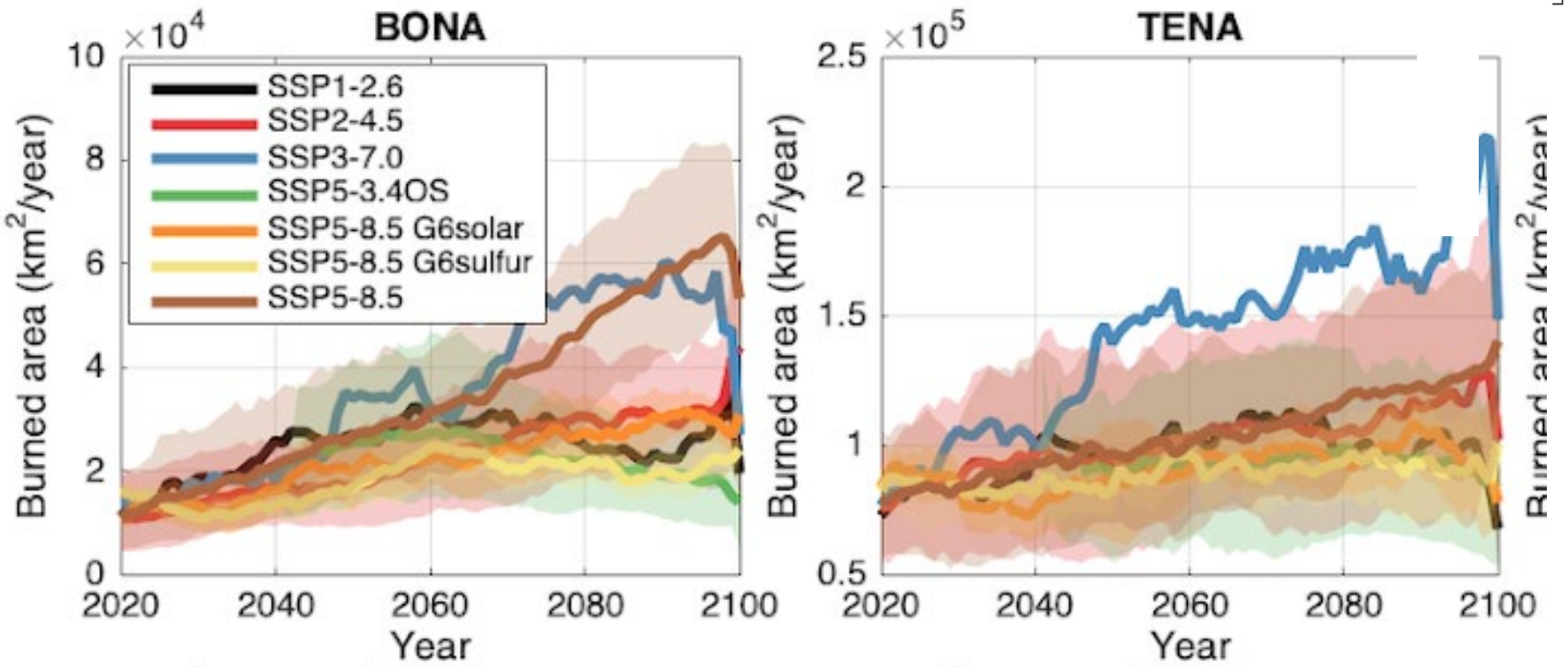


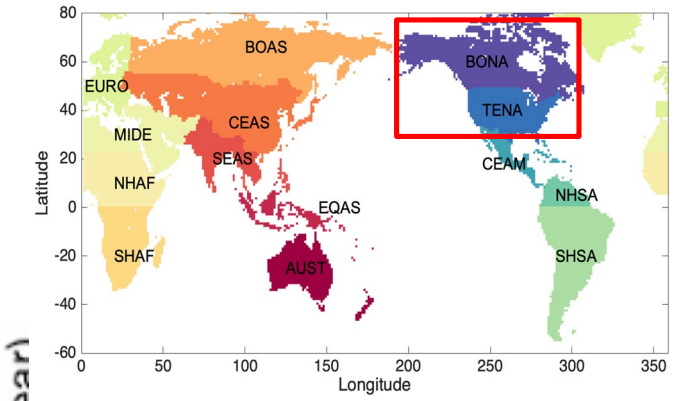
Change in Burned Area



40°N–70°N is the only latitude band in which the burned area consistently increases under all seven scenarios.

Regional changes in burned area

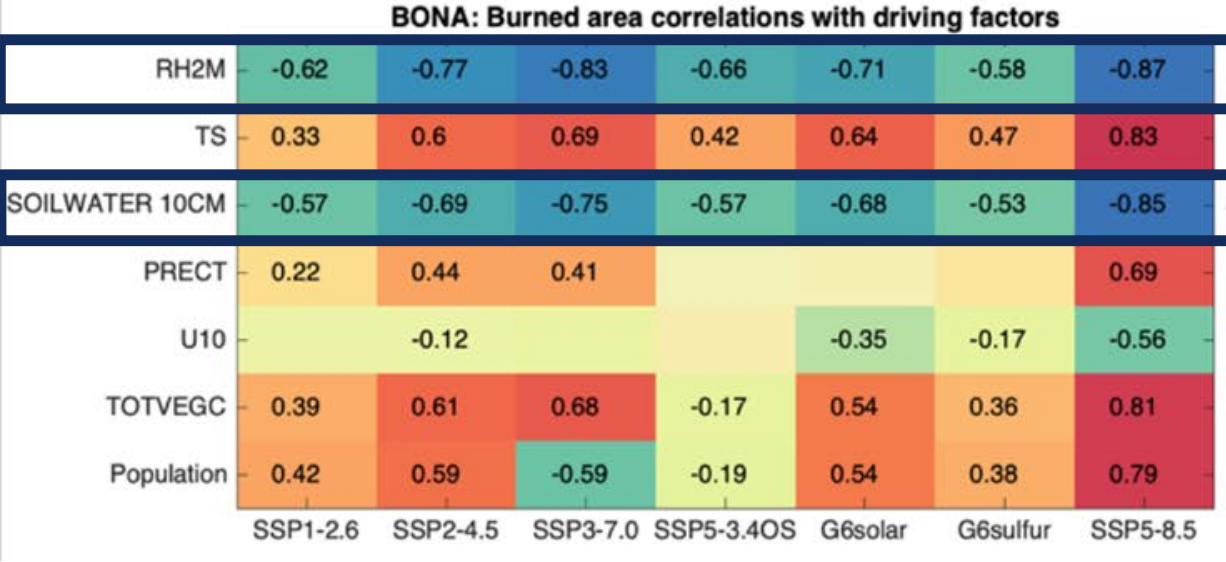




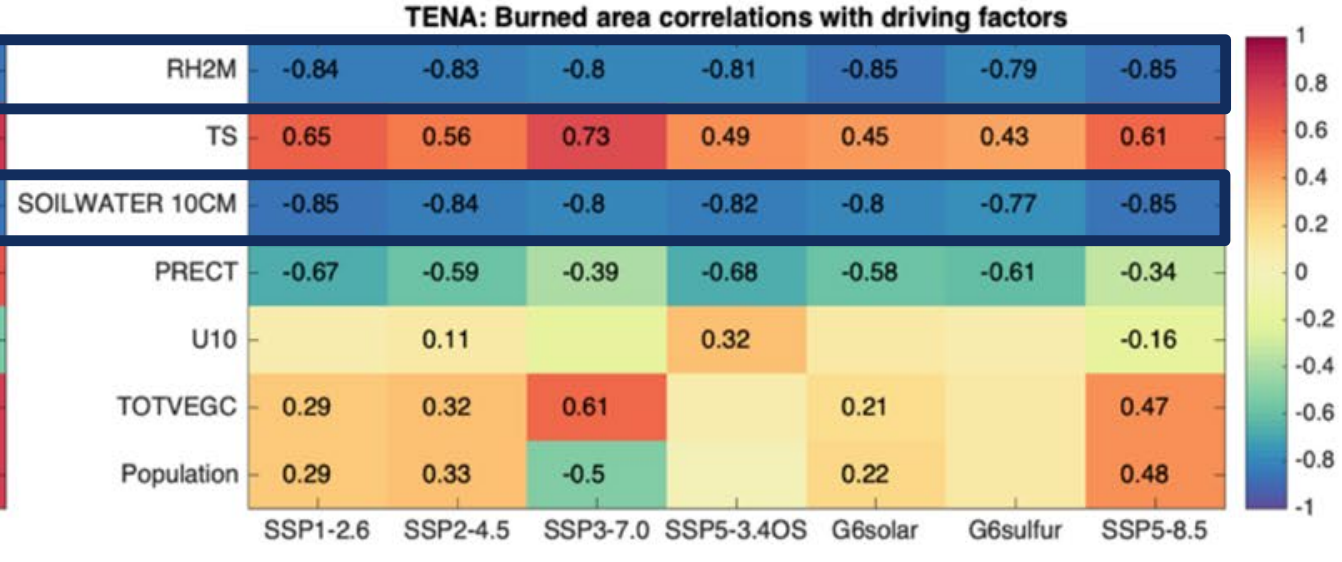
Largest changes occur in Boreal and Temperate North America.

Correlations of burned area to driving factors

Boreal North America



Temperate North America



Over North America, relative humidity and soil moisture are the most important driving factors.