

An interactive web interface to compare the Localized Constructed Analogs 2 (LOCA2) with its precursor and CMIP6

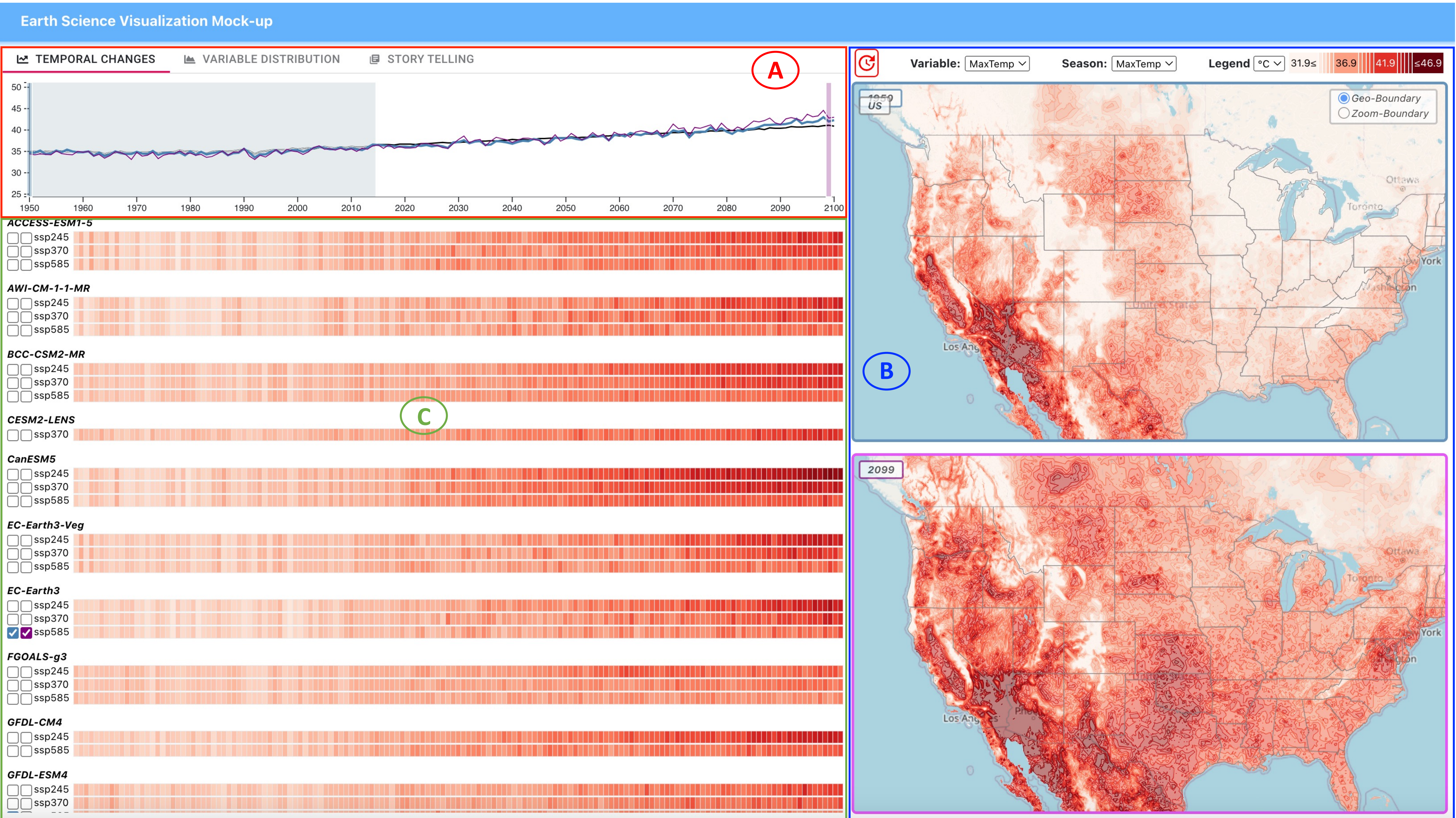
(URL: <https://vizus.cs.usu.edu/app/earth-loca/>)

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- The interactive web service for visualizing and analyzing extreme indices from the Localized Constructed Analogs 2 (LOCA2) designed to facilitate data-driven decision-making.



- A**
- Temporal changes: time series of the selected variable
 - Variable distribution: spatial distribution of the selected variable
 - Story telling: animation
- There are two interactive areas colored in blue and purple. Brushing allows users to select specific periods by clicking and dragging within these areas.

- C**
- Heat maps
 - Checkbox interaction: the blue and purple checkboxes correspond to the maps at the top (blue) and bottom (purple) in panel B.

- B**
- The top (blue) and bottom (purple) display the selected variable averaged for the chosen model and time periods in A and C.
 - Users can visualize various extreme indices for different seasons (annual and four seasons) and select their preferred unit.
 - Mouseover displays the value and associated contour.
 - Double-click selects a U.S. state or shows the entire domain.

Localized Constructed Analogs (LOCA)

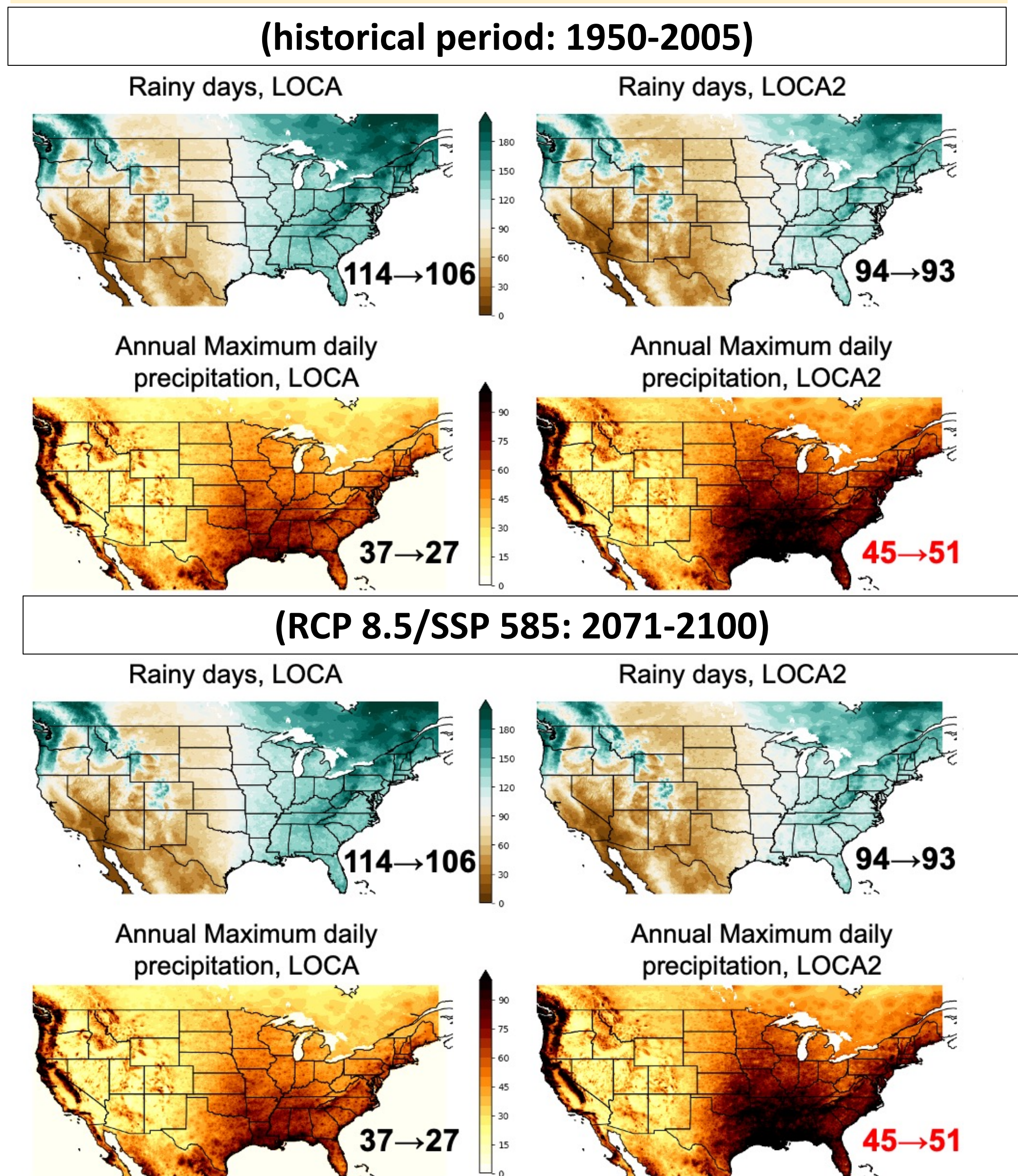
<https://loca.ucsd.edu>; Pierce et al., 2023

- LOCA is a statistical downscaling technique that uses past history to add improved fine-scale detail to global climate models.
- Two principal enhancements in LOCA2 include: 1) updated observation with more realistic extreme precipitation, and 2) an improved bias-correction methodology
- Both LOCA2 and the Seasonal Trends and Analysis of Residuals (STAR) are utilized in the fifth United States National Climate Assessment (NCA5).

	LOCA	LOCA2
Source data	32 CMIP5 models (RCP 4.5 and RCP 8.6)	27 CMIP6 models (SSP245, SSP370, and SSP 585)
Spatial domain	North America (CONUS, Southern Canada, and central Mexico)	
Period	1950-2100	
Resolutions	Daily and 1/16 th degree (~ 6km)	

Objectives

- Compare LOCA2 with its predecessor LOCA, using the following metrics:
 - Maximum daily precipitation
 - Number of rainy days (> 1 mm/day)
 - Maximum consecutive 5-day precipitation (Rx5day)
 - Maximum temperature
- Develop a web-based visual interface for scientists and end-users of NCA5 to visualize and validate LOCA2.



- LOCA2 shows fewer rainy days, but more extreme precipitation than LOCA, especially in the Southeastern US.
- According to LOCA2, we can expect heavier extreme precipitation under the SSP585 emission scenario.