

Climate Change Summary, Crater Lake National Park, Oregon

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Climate Trends for the Area within Park Boundaries

- Temperature since 1950 has increased, but the rate is not statistically significant (Figs. 1, 2). The weather station network for 1950-2010 was more stable than in the period 1895-2010.
- Precipitation since 1950 has decreased, but the rate is not statistically significant (Figs. 3, 4).
- If the world does not reduce emissions from cars, power plants, and deforestation by 40 to 70%, models project substantial warming and slight increases in precipitation (Figure 5).

Vulnerabilities of the Klamath-Siskiyou Region

- From 1949 (Whittaker 1960) to 2007 (Damschen et al. 2010), plant species with cooler habitat requirements decreased in abundance or shifted northward, consistent with warming.
- Under high emissions, fire frequencies could increase up to 25% by 2100 (Moritz et al. 2012).
- Snowpack may continue to decrease and reduce summer streamflow (Mote et al. 2014).
- With continued emissions, the number of heavy rain events could double (Walsh et al. 2014).

Table. Historical and projected changes (data Daly et al. 2008, IPCC 2013; analysis Wang et al. in preparation). The table only gives central values. Figures 1, 3, and 5 show the uncertainties.

	1950-2010	2000-2050	2000-2100
Historical			
temperature	+1.0°C/century (+1.8°F./century)		
precipitation	-18%/century		
Projected (compared to 1971-2000)			
Low emissions (IPCC RCP 4.5)			
temperature		+1.9°C (+3.4°F.)	+2.6°C (+4.7°F.)
precipitation		+2%	+3%
High emissions (IPCC RCP 6.0)			
temperature		+1.7°C (+3.1°F.)	+2.9°C (+5.2°F.)
precipitation		+1%	+5%
Highest emissions (IPCC RCP 8.5)			
temperature		+2.4°C (+4.3°F.)	+4.5°C (+8.1°F.)
precipitation		+3%	+4%

Figure 1. Temperature.

Historical annual average temperature for the area within park boundaries and 1950-2010 trend.
(Data: Daly et al. 2008, IPCC 2013. Analysis: Wang et al. in preparation, University of Wisconsin and U.S. National Park Service).

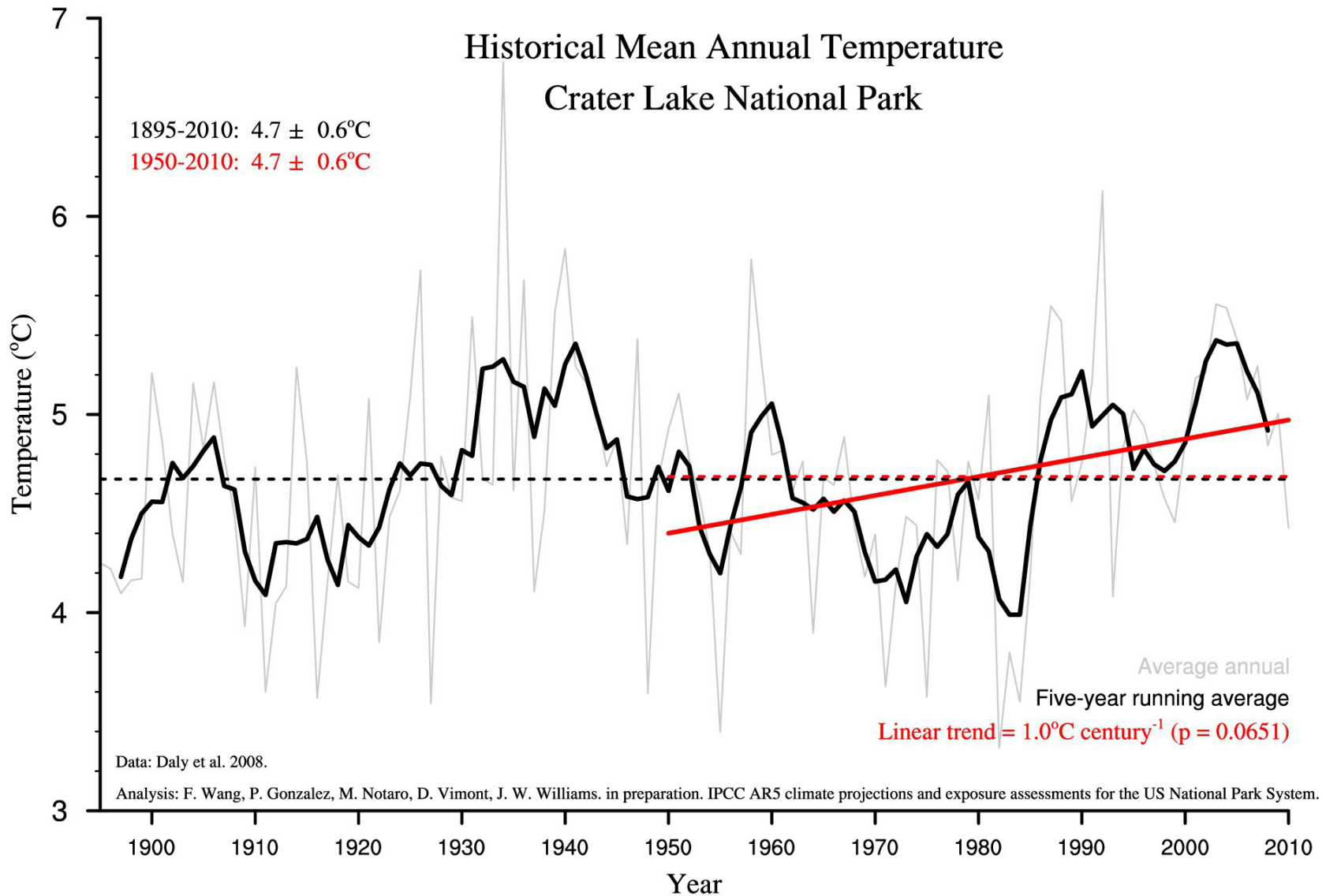


Figure 2.

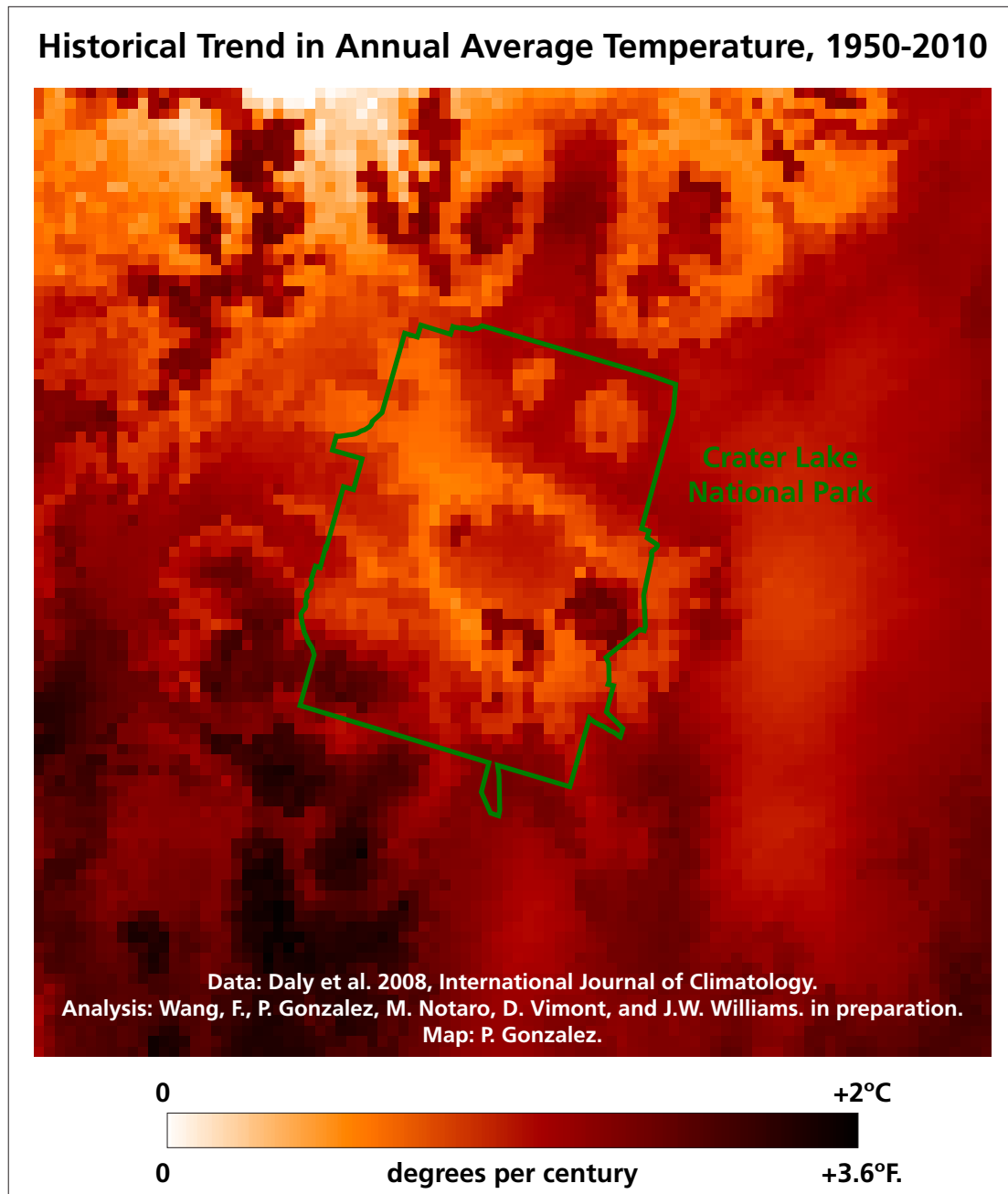


Figure 3. Precipitation.

Historical annual total precipitation for the area within park boundaries and 1950-2010 trend.
(Data: Daly et al. 2008, IPCC 2013. Analysis: Wang et al. in preparation, University of Wisconsin and U.S. National Park Service).

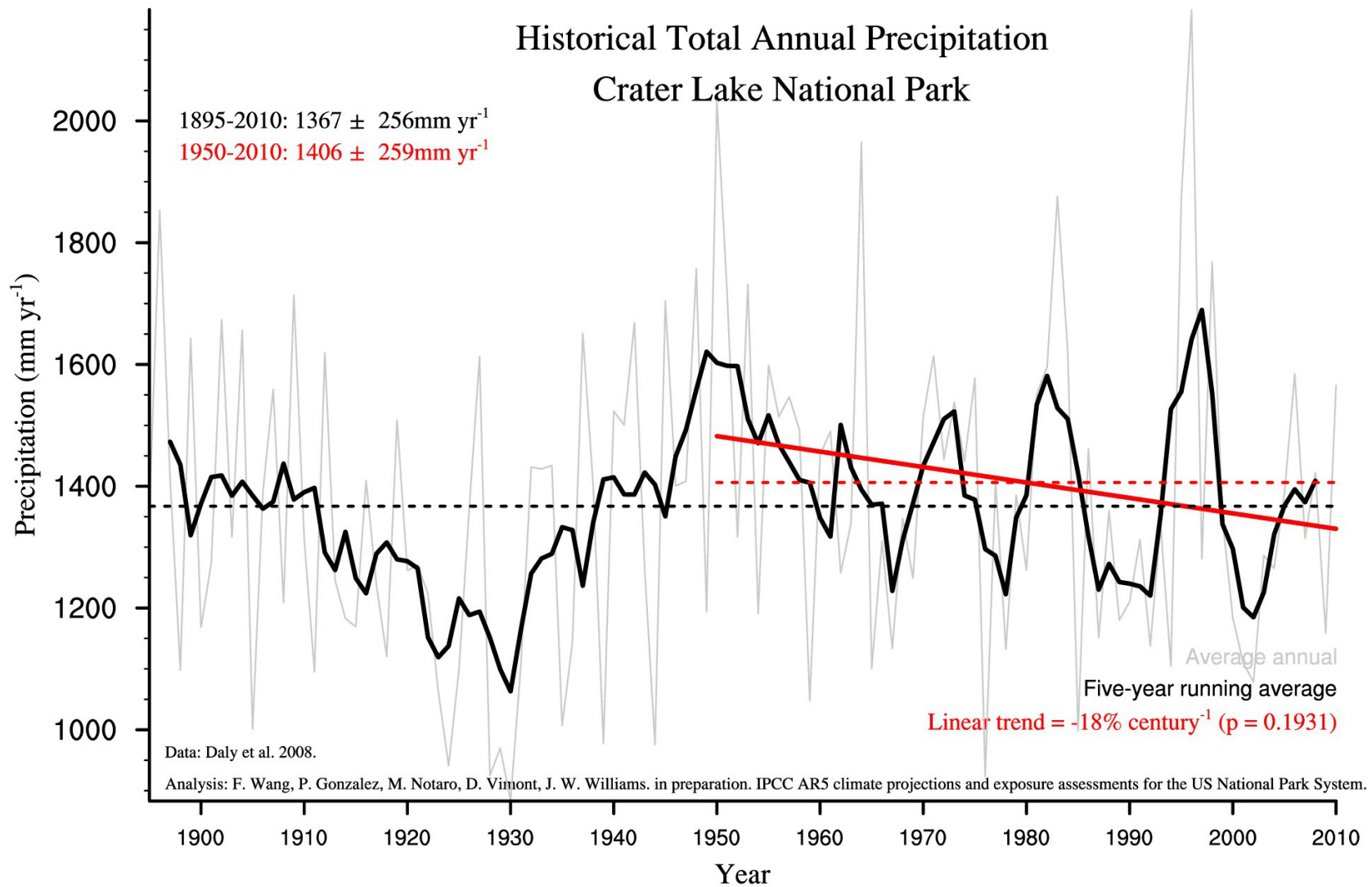


Figure 4.

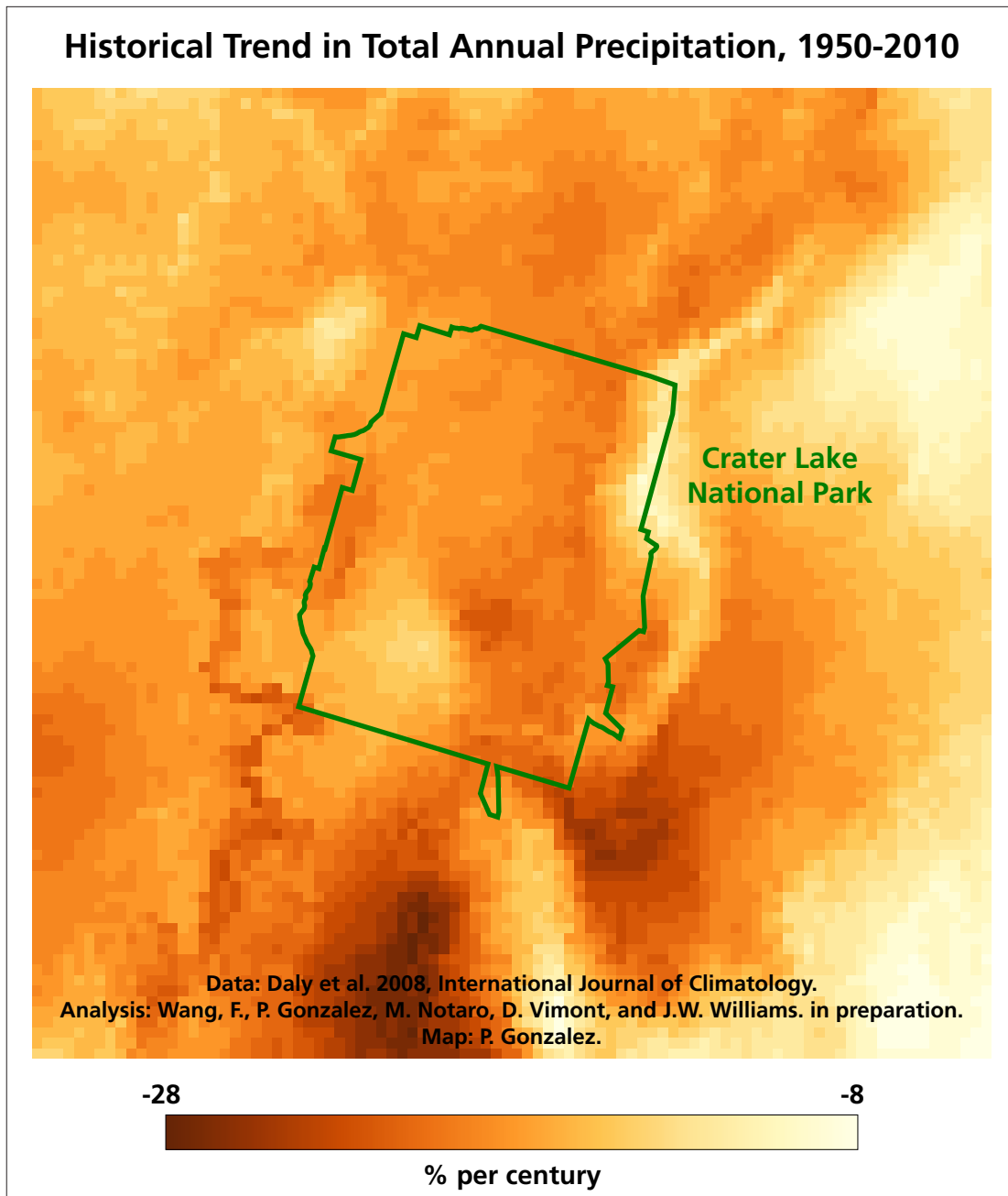
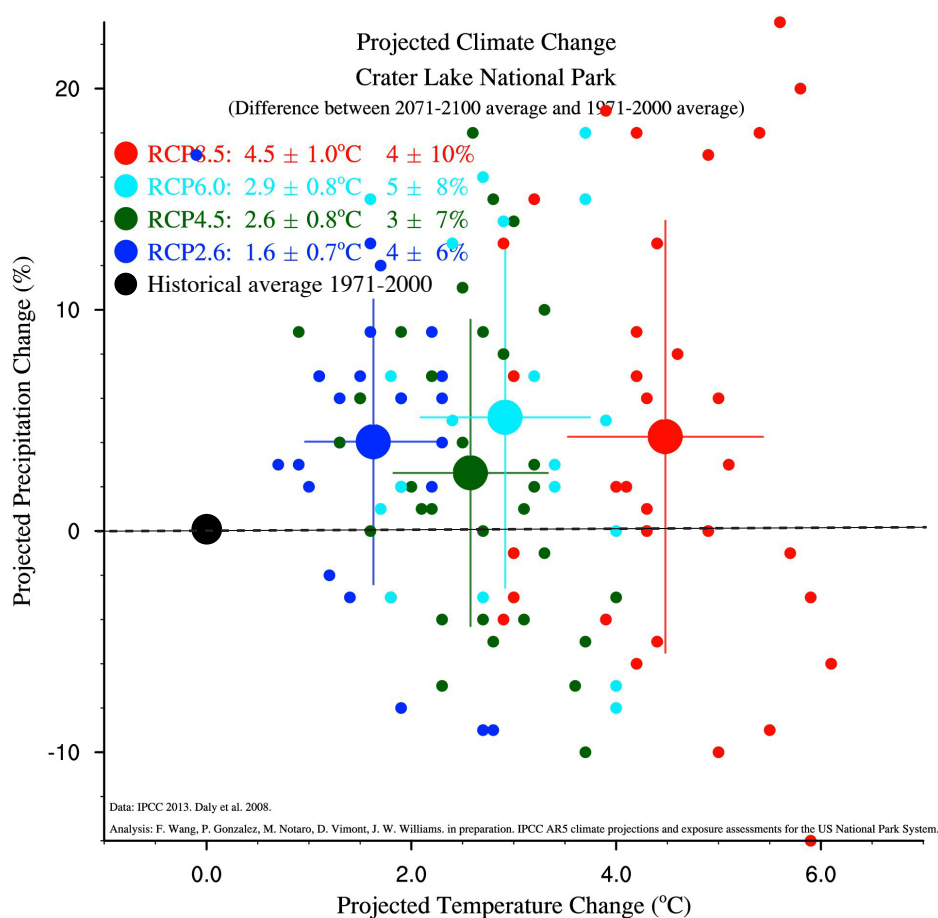


Figure 5. Projections of future climate for the area within park boundaries. The large black dot is the current combination of temperature and precipitation. Each small dot is the output of a single climate model. The large color dots are the average values for the four IPCC emissions scenarios. The lines are the standard deviations of each average value. (Data: IPCC 2013, Daly et al. 2008; Analysis: Wang et al. in preparation, University of Wisconsin and U.S. National Park Service).



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