

Climate Change Summary, Obed Wild and Scenic River, Tennessee

Patrick Gonzalez

Natural Resource Stewardship and Science, U.S. National Park Service, Washington, DC

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Climate Trends for the Area within Park Boundaries

- Temperature (Figure 1) and precipitation (Figure 2) have increased since 1950, but the trends have not been statistically significant.
- If we do not reduce global emissions from cars, power plants, and deforestation by 40 to 70%, models project substantial future warming and increases in precipitation (Figure 3; emissions scenarios RCP6.0 and RCP8.5).
- The number of days with a maximum temperature >35°C (95°) in the area of the park may increase 15-20 days per year by 2100 (Ingram et al. 2013).

Vulnerabilities of Central Tennessee

- Projected changes in rainfall timing and amount, potential evapotranspiration, and other factors may alter river and stream hydrology and reduce water availability (Ingram et al. 2013).
- Continued warming of water temperatures could threaten coldwater fish (TWRA 2009).
- Continued climate change may shift ranges of red maple (*Acer rubrum*), white oak (*Quercus alba*), and other species northward (Iverson et al. 2008).

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 1-2 show the uncertainties.

	1950-2010	2000-2050	2000-2100
Historical			
temperature	+0.2°C/century (+0.4°C/century)		
precipitation	+8%/century		
Projected (compared to 1971-2000)			
Low emissions (IPCC RCP4.5)			
temperature		+2.1°C (+3.8°F.)	+2.6°C (+4.7°F.)
precipitation		+5%	+6%
High emissions (IPCC RCP6.0)			
temperature		+1.7°C (+3.1°F.)	+3.0°C (+5.4°F.)
precipitation		+5%	+6%
Highest emissions (IPCC RCP8.5)			
temperature		+2.6°C (+4.7°F.)	+4.7°C (+8.5°F.)
precipitation		+6%	+9%

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).

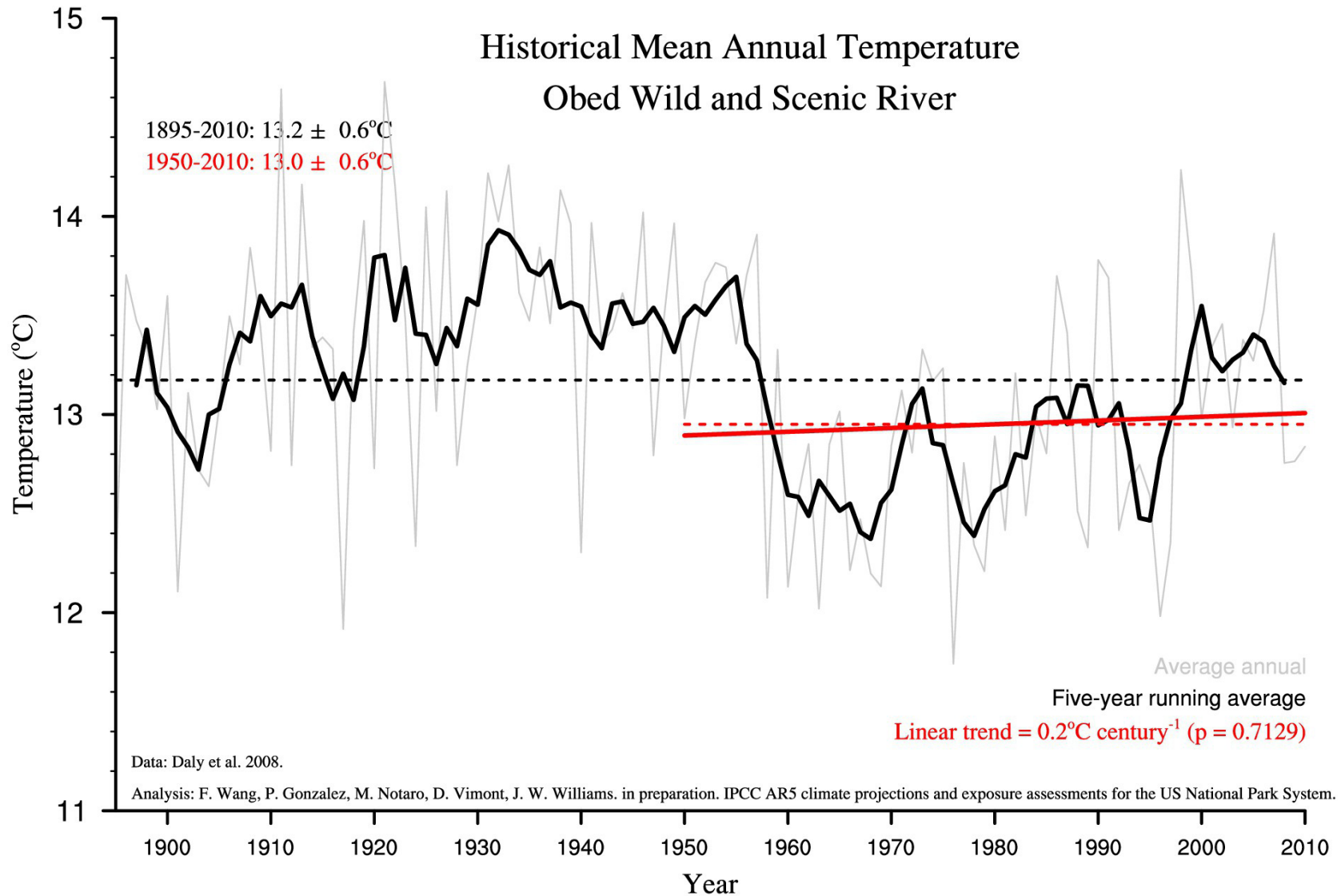


Figure 2. Precipitation.

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).

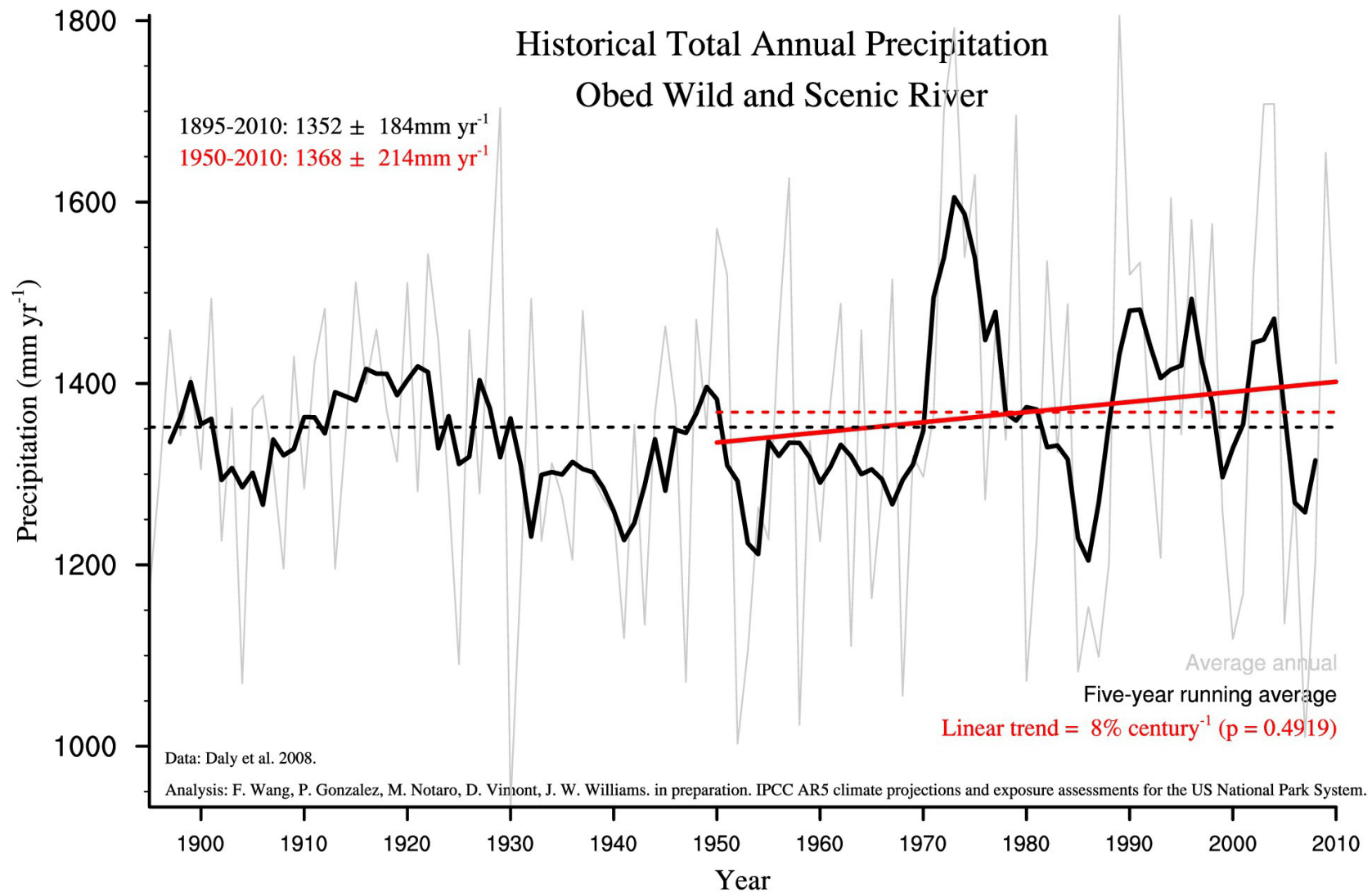
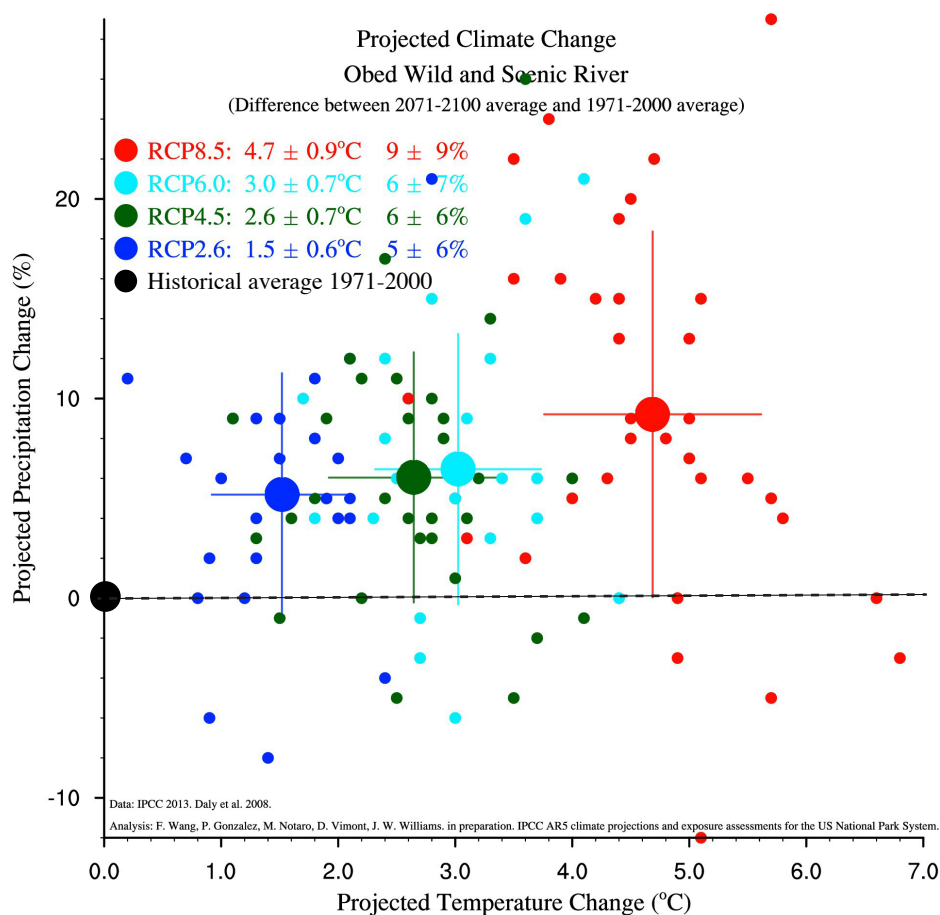


Figure 3. Projections of future climate for the area within park boundaries. The large black dot is the current combination of temperature and precipitation. Each small dot is the output of a single climate model. The large color dots are the average values for the four IPCC emissions scenarios. The 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).



References

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