Climate Change Summary, Tupelo National Battlefield, Mississippi

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Climate Trends for the Area within Park Boundaries

- While temperatures have warmed globally, the southeastern U.S. is unusual because temperature has not increased due to El Niño and other factors (Portmann et al. 2009).
- Since 1950, climate trends in the park have not been statistically significant (Figures 1-2).
- Models project future warming and increases in precipitation (Figures 1-2).

Changes per century (data Daly et al. 2008, IPCC 2013; analysis Wang et al. in preparation). The table only gives central values. Figures 1 to 3 show the uncertainties around these values.

	1950-2010	**2000-2050**	**2000-2100**
Historical			
Temperature, annual average	-0.2ºC (0.4ºF.)		
Precipitation, annual total	+14%		
Projected (compared to 1971-2000)			
Low emissions (IPCC RCP 4.5)			
Temperature, annual average		+2.1ºC (3.8ºF.)	+2.6ºC (4.7ºF.)
Precipitation, annual total		+4%	+5%
High emissions (IPCC RCP 6.0)			
Temperature, annual average		+1.7ºC (3.1ºF.)	+3.0ºC (5.4ºF.)
Precipitation, annual total		+3%	+3%
Highest emissions (IPCC RCP 8.5)			
Temperature, annual average		+2.6ºC (4.7ºF.)	+4.7ºC (8.5ºF.)
Precipitation, annual total		+5%	+6%

Potential Future Vulnerabilities for the Southeastern U.S.

- The number of days with a maximum temperature >35ºC (95º) in the area of the park may increase 20 to 55 days per year by 2100 (Ingram et al. 2014).
- Warmer temperatures may increase southern pine beetle infestations (Ingram et al. 2014).
- Ground-level ozone concentrations may increase in some areas (Ingram et al. 2014).
- Winter ranges of numerous bird species have shifted northward 0.5 ± 2.4 km (0.3 ± 1.5 mi.) per year (1975-2004) across the U.S. and shifts may continue (La Sorte and Thompson 2007).

Figure 1. Temperature.
Historical and projected average annual average temperature for the area within park boundaries. For projections, each bar shows one standard deviation above and below the average of up to 33 climate models. (Data: Daly et al. 2008, IPCC 2013. Analysis: Wang et al. in preparation, University of Wisconsin and U.S. National Park Service).

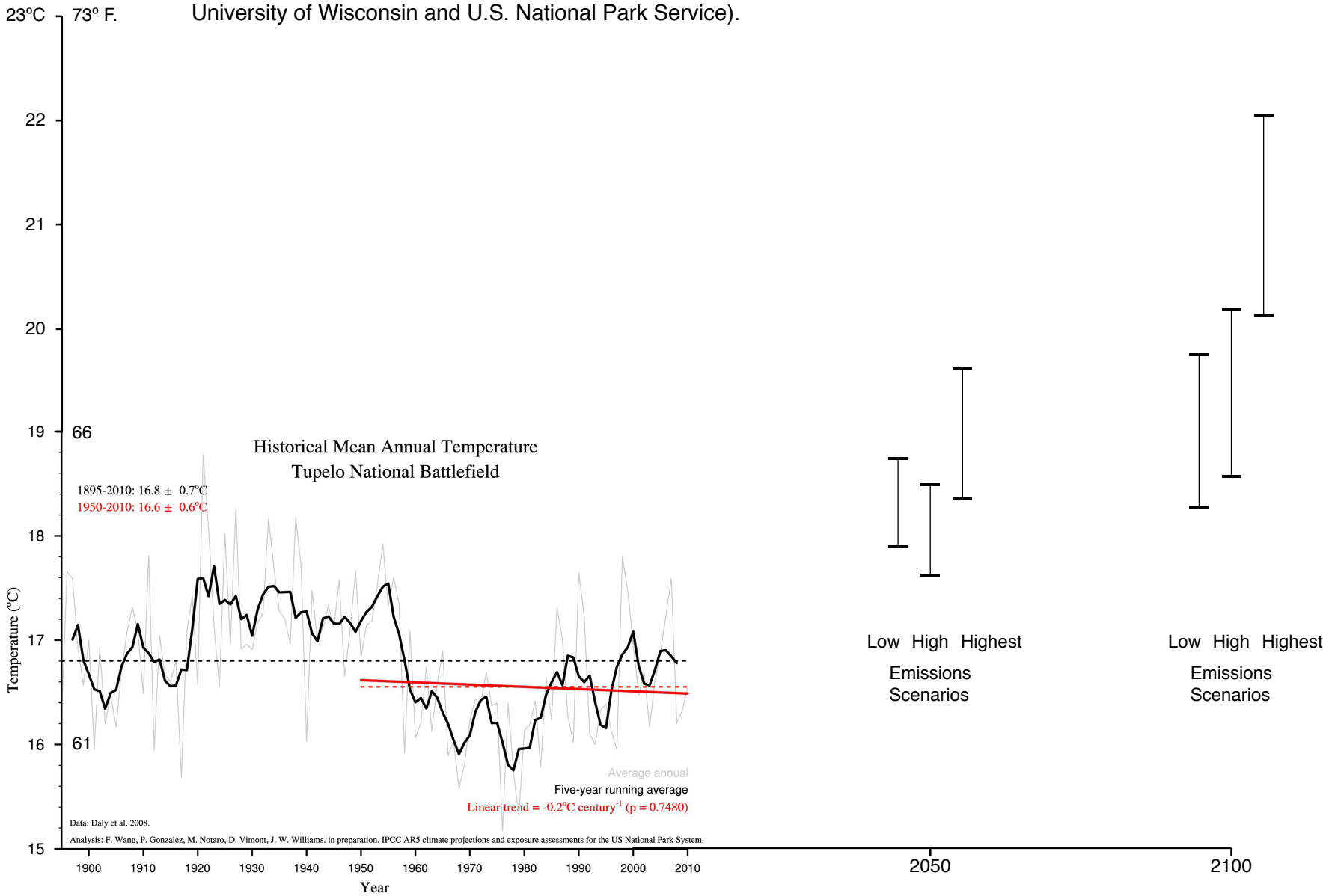
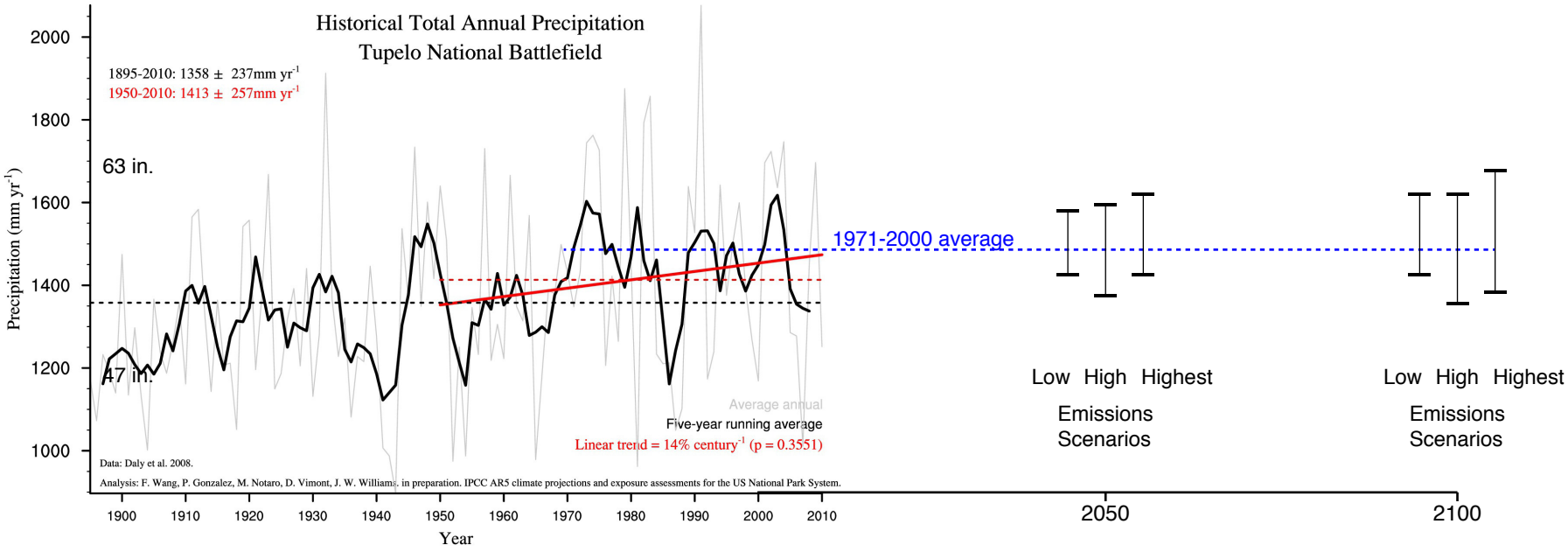


Figure 2. Precipitation.
Historical and projected annual total precipitation for the area within park boundaries.
For projections, each bar shows one standard deviation above and below the average of up to 33 climate models. (Data: Daly et al. 2008, IPCC 2013. Analysis: Wang et al. in preparation, University of Wisconsin and U.S. National Park Service).



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