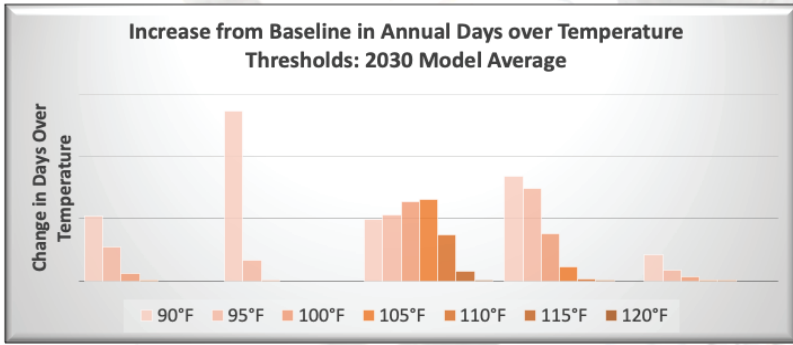


CLIMATE - WORKER IMPACT STUDY

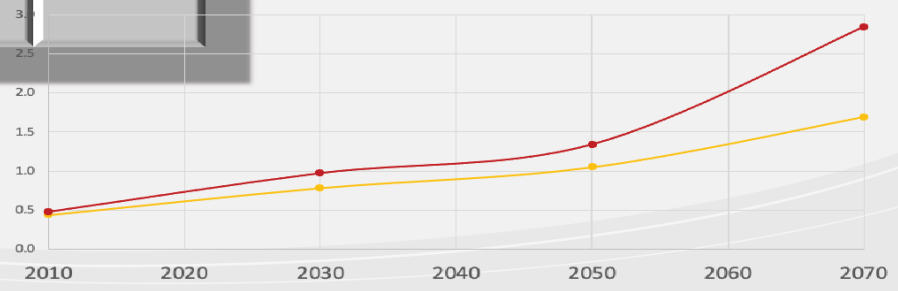
Impact of Rising Temperatures on Workers and Operations

Heat Index	Risk Level	Protective Measure
Less than 91°F	Lower (Caution)	Basic heat safety and planning
91° to 103°F	Moderate	Implement precautions and heighten awareness
103° to 115°F	High	Additional precautions to protect workers
Greater than 115°F	Very High to Extreme	Triggers even more aggressive protective measures



		2030	2050	2070
Moderate Standard	RCP 4.5	\$25,000	\$31,000	\$63,000
	RCP 8.5	\$28,000	\$40,000	\$74,000
Strict Standard	RCP 4.5	\$65,000	\$141,000	\$196,000
	RCP 8.5	\$66,000	\$190,000	\$310,000

Average Annual High Heat Index Days



About Resilient Analytics

Resilient Analytics answers climate impact questions with the Infrastructure Planning Support System (IPSS). IPSS is a unique, first-of-its-kind system that performs engineering analysis within a broader resiliency perspective. IPSS models infrastructure vulnerability to future climate conditions, considers specific adaptation scenarios, and provides a cost benefit based risk analysis. IPSS draws its data from a range of climate science projections, engineering and materials studies, and environmental research to provide users with decision support that is based in real-world risk scenarios.

Resilient Analytics Project Summaries

Extreme heat is one of the leading causes of weather-related deaths in the U.S. The National Oceanic and Atmospheric Administration lists heat waves as causing four of the top 10 deadliest U.S. disasters since 1980. Rising temperatures, associated with climate change will amplify the safety and health hazards from extreme heat. Outdoor workers who are performing physically demanding work and/or need to wear protective clothing are especially vulnerable.

According to government data, exposure to excessive environmental heat stress killed 783 U.S. workers and seriously injured 69,374 workers from 1992 through 2016 across all industries. Additionally, numerous studies provide evidence that extreme heat increases the number of workplace accidents. Heat waves, defined as three or more consecutive days with daily maximum temperature over 95°F, increase workers' compensation claims in outdoor industries by 6.2%.

A study conducted by MIT and William and Mary found that days with maximum temperature between 90° and 95°F result in 10.3% more accidents, days between 95° and 100°F have 12.7% more accidents, days between 100° and 105°F have 29.4% more accidents, and days with maximum temperature over 105°F have 37.8% more accidents, all relative to days with maximum temperature between 65° and 70°F .

Resilient Analytics, Inc conducted a study in conjunction with major utilities to determine the potential impact to field workers. The projected impact of temperatures s projected to place workers at high levels of risk if no adaptation measures are taken. These projected increases have ramifications for the health, safety and productivity of workers in enclosed spaces.

Regarding productivity, the number of hours where breaks will be required will increase significantly, resulting in costs that could potentially reach six figures for many utilities by 2030. Closely related to this issue is the increase in number of heat-related accidents. If no adaptation procedures are put in place, it is projected that workplace accidents could increase up to 8% by 2030 and up to 17% in some locations by 2070.

In addition to these quantifiable impacts, workers in non-conditioned and/or confined spaces who are exposed to high ambient temperatures could experience an increased likelihood of accidents or health issues.

These results should be considered by all organizations who have workers exposed to high heat. The potential cost of climate change must include personnel-based increases.

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