



BCAA

Boise Climate Adaptation Assessment

Building Climate Readiness in Boise

Boise residents are likely noticing subtle differences in the climate of the Treasure Valley: hotter days in the summer, lower water levels in Lucky Peak Reservoir in the fall, and winter recreation starting later in the season. Awareness of the increased frequency and severity of wildfires, like the 2016 Pioneer Fire, and their impact on the quality of our air has also risen. These changes in our local climate are consistent with trends that are occurring across the country and around the world.

In order to prepare for future changes and enhance our resiliency, the City of Boise launched the Boise Climate Adaptation Assessment (BCAA) by engaging with researchers from the University of Idaho, Boise State University, and The Langdon Group. The aim of the BCAA is to better understand local climate impacts, begin planning for them, and in-turn, decrease our vulnerability.

This report is the start of the City's discussion of this important topic. Before we can begin preparing for future changes, we must understand them by assessing the risks and quantifiably evaluating the impacts now and projections for the future. The BCAA discussion will continue and provide opportunities for citizens to engage in conversation and be part of the planning process.

Climate Risk Assessment

The Langdon Group and Dr. John Abatzoglou from the University of Idaho were tasked by the City to determine the most significant climate change related impacts that Boiseans will experience over the next 60 years. Based on scientifically credible information from climate models, the following impacts were examined:

1. Heat Stress Days: Days in which the heat index exceeds 91 degrees, and its impact on heat-related illness.
2. Heavy Precipitation Days: Days with a higher than normal rainfall that exceed the capacity of current stormwater and water renewal systems.
3. Irrigation Demands: The amount of water lost through evapotranspiration and its direct impact to irrigating our lawns, parks and gardens.
4. Drought Frequency: The likelihood of drought conditions and its impact on the public.
5. Poor Air Quality Days: Area wildfires' impact to air quality in Boise.
6. Seasonal Stream Flows: The magnitude and timing of runoff in the Boise River and its impacts on irrigation water supply.
7. Flooding Danger: The magnitude and timing of flooding events on the Boise River.
8. Water Quality: The occurrence of exceptionally low flows on the Boise River and its impact to water quality.



*Esther Simplot Whitewater Park on a smokey day in 2016.
Patrick Sweeney.*

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Climate Risk Assessment *continued*

The following breaks down each of these impacts in greater detail, however a more thorough description of the science that contributed to these findings can be requested by contacting sustainability@cityofboise.org.

Heat stress days: The frequency of Moderate Risk days (heat index greater than 91 degrees F) for heat extremes will increase from a historical baseline of around 16 days per summer to 66 days per summer by the mid-21st century. High Risk days (heat index greater than 103 degrees F) have been exceedingly rare in Boise; however, such days will become more common during the 21st century.

Heavy Precipitation Days: The occurrence of heavy precipitation events (daily total exceeding 0.7") is projected to increase in Boise by approximately 50% by the early 21st century and nearly 100% by the mid-21st century.

Irrigation Demands: Climate change will increase evaporative demand and irrigation requirements during the warm season. An increase of approximately 2 inches of irrigation is projected by the early 21st century, and 4 inches of irrigation by the mid-21st century.

Drought Frequency: Moderate drought which currently occurs in 1 of every 4 years, on average, is projected to occur in 1 of every 2 years, on average, by the mid-21st century. Drought frequency is projected to increase despite increases in heavy precipitation events due to increased evaporative demand with warming. Likewise, exceptional drought that historically occurs, on average, 1 out of every 12 years, is projected to occur in nearly 1 of every 3-4 years by the mid-21st century.

Poor Air Quality Days: The duration of the summer period under which forests and high desert landscapes are projected to be critically dry is projected to increase 40-100%, and the odds of very large fires in the Boise airshed region is projected to increase by 400% by the mid-21st century. These changes suggest increased potential for chronic air quality problems within the metropolitan area.

Seasonal Stream Flows: Seasonal shifts in river levels for the Boise River are projected, resulting in more runoff in the winter and spring and less during the summer months.

Flooding Danger: No overall change in river flooding is projected. However, a greater proportion of high streamflow events are projected to occur during the fall through winter as a consequence of changes in snow and snowmelt timing on upstream watersheds and more winter precipitation falling as snow and directly running off.

Water Quality: The advancement in the timing of mountain snowmelt, increased evaporative demand, and extended period of warm and dry conditions during the summer months are projected to result in further declines in low flows in the Boise River. Conditions that are detrimental to water quality and aquatic life are expected to increase substantially, with a 400% increase the frequency of what are historically considered low flow levels by the mid-21st century.

Now that the City has this localized climate risk assessment data, possible next steps include:

- Use in long-range planning for City operations (water resources, lands management, etc.) and
- Engagement with community members and regional partners to discuss impacts.

