

Building for Tomorrow: Utah's Changing Relationship with Snow in a Future Climate

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How are good decisions made when the future is unclear? By blending data science with domain expertise, we can consider possible outcomes through probability estimates.

Dr. Brennan L. Bean, a data scientist, and Dr. Wei Zhang, a climate scientist, are expanding the path for transforming data analysis into impactful decisions. Their research aims to inform the first formal initiative to incorporate climate change considerations into U.S. building design standards.

Researchers typically use a combination of data and scientific methods to develop theories and draw conclusions. However, Dr. Bean and Dr. Zhang have taken the innovative approach of applying this process to real-world situations in the context of a changing climate.

In Utah, snow accumulation is a critical factor in building construction. Structures must be engineered to endure potential snow loads while avoiding excessive costs associated with over-engineering.

Historical weather data plays a vital role, as it helps assess past snowpack levels and identify extreme weather occurrences. Historical weather measurements are compiled, analyzed, and mapped at thousands of measurement stations across the continent; engineers then use that information to establish building codes and to make other essential decisions.

But what if the future doesn't resemble the past?

The reliability of historical data is tested by changing climate patterns. Today's structures must be designed to

withstand a wider range of weather conditions that may arise from future climate change.

Dr. Bean and Dr. Zhang combine historical data with future climate models to create a range of possible outcomes. This integration of climate and data science provides better information for engineers and decision-makers. Ultimately, they will use probability estimates to make choices today that will impact the next generation of American buildings.



