METEOROLOGY AND CLIMATE CHANGE — OVERVIEW

Interpreting the weather—past, present and future—
for better safety, efficiency, profit and resiliency

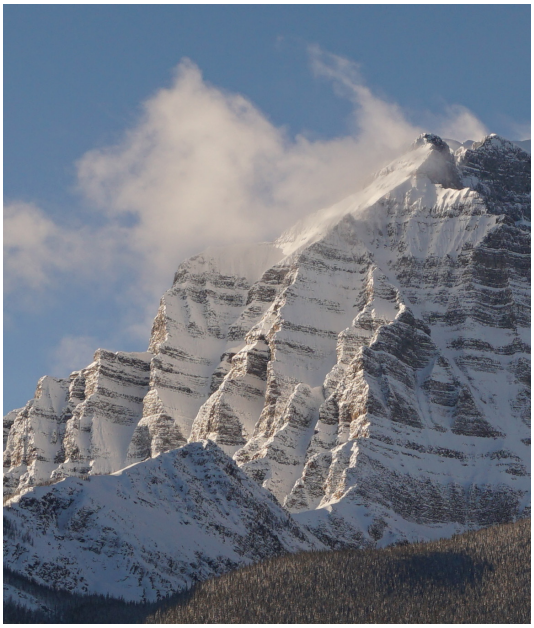
Our Approach

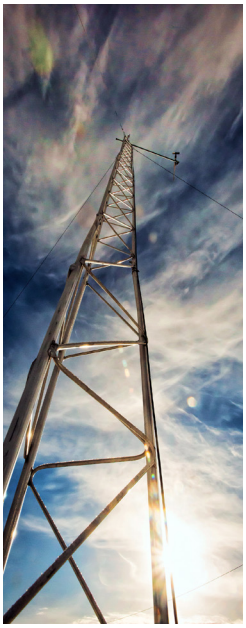
Climate and weather affect everything in the built environment, including not only buildings and infrastructure but also the people who inhabit it and the air they breathe. Understanding the mechanisms of weather and climate and their impact is a key element in all our work.

Our staff has unusually broad expertise in this area. Project teams include meteorologists, engineers, climatologists, experts in numerical modeling and other scientists. Modeling work is supported by research-caliber high-performance computing services. Our staff will draw collaboratively on these exceptionally deep resources to help you find creative, optimized solutions.

We work with the full range of weather, from typical to extreme. For typical conditions, we look at effects on routine operations and everyday human comfort. For the rarest and most extreme events, we look for ways to ensure the continued safety and functionality of your project. Drawing on expertise gained over hundreds of projects, we suggest how you can mitigate any negative impacts of weather and climate. These analyses help ensure that your project is optimally engineered for its local climate.

In every engagement, we look beyond the obvious and the conventional and focus on the specific circumstances of your project. We ask the right questions and use appropriate resources and tools to ensure we get the right climate and weather information. We have the expertise to analyze and interpret the data to ensure it is relevant and representative for your project site. We turn the data into a solution that works for you.





Our Services

One way to see our range of weather-related services is to think in terms of perspective, time and specificity. Analyses may look either forward or backward, consider a short or long timeframe or focus on a specific site or a broader region. A brief overview of each area follows, with a link to more detail.

Climate analytics and statistics

In our climate analytics and statistics services, we use sophisticated models and statistical tools to investigate the historical weather record over many years. With these studies, we can help you understand trends and typical patterns and predict the frequency of rare events that may affect your project or operations. This service is frequently employed in conjunction with other services, such as wind engineering of buildings or bridges and studies of pedestrian comfort and safety.

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Weather reconstruction.

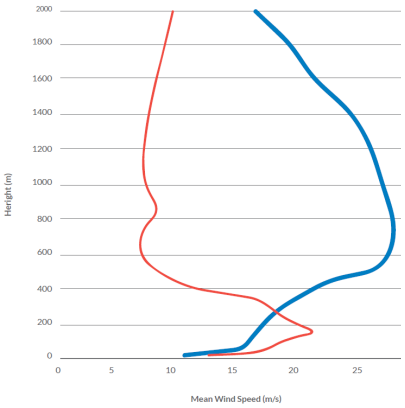
We use similar modeling approaches to "fill in the blanks" in a weather reconstruction when historical data aren't available or aren't specific or accurate enough. (For example, weather stations may be too far away or too different.) Our hallmark is that we have the deep knowledge of weather and the physics of the atmosphere to make the best possible interpretation of the climate at your site. For example, we can use the nearest available data to interpret likely conditions at a specific place and time during an accident or adverse event. We can also make broader reconstructions that approximate a historical record at a project site. We can evaluate the reliability of measured data for your site and tell you whether a reconstruction would help. With a reconstruction, you can evaluate weather trends and patterns and design accordingly.

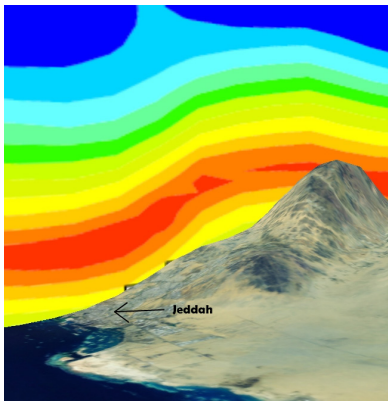
Forecast meteorology

In some industries, weather is money. Our forecast meteorology services focus on industry-specific forecasting solutions that support operational decisions. We work with you to customize delivery so you get only what you need, only when you need it. Industries that can benefit from such forecasts include construction, winter resorts, film and commercial production, transportation management, resource extraction and port operations, among others.

Climate change studies

If the long term is your concern, our climate change studies can help you prepare for the future. We know that generalized global scenarios are not much help when your responsibilities are local. By combining numerical and statistical techniques with the best climate models available, we project weather trends at a very local level for 20 to 30 years in the future. Then we help you interpret how changes in both typical and extreme conditions could affect your building, community or industry. These insights guide our suggestions for ways to adapt.





How we work

We continually invest in the capabilities of our staff and our technical resources to meet the requirements of today's most sophisticated analytical methods. We employ the most advanced meteorological models, such as WRF, as well as state-of-the-art analysis and visualization tools such as NCL, VERDI and VAPOR. For our computationally intensive modeling applications, we leverage the power of our high-performance Beowulf Linux cluster.

We are constantly updating our enterprise databases of hundreds of millions of historical and real-time observations, Monte Carlo simulations, weather forecasts, and model re-analysis outputs from international data centers.