

WEATHER FORECASTS FOR CRANE OPERATIONS



OUR TEAM'S CAPABILITIES

- Provide weather forecasts critical for safe crane operations
- Site-specific forecasts delivered to desktops/mobile devices anywhere
- Operators can more confidently plan/schedule lift times around weather
- Lightning early warning and real-time detection
- Increase safety, efficiency, profitability, and competitiveness

WEATHER FORECASTS

- State-of-the-art forecast engine runs on high-performance computing systems located on the DRI campus
- Algorithms use exact crane location & learn from past forecast performance
- Displayed 24/7/365 with DRI's Real Time Environmental Monitoring and Alerting System (REMAS)

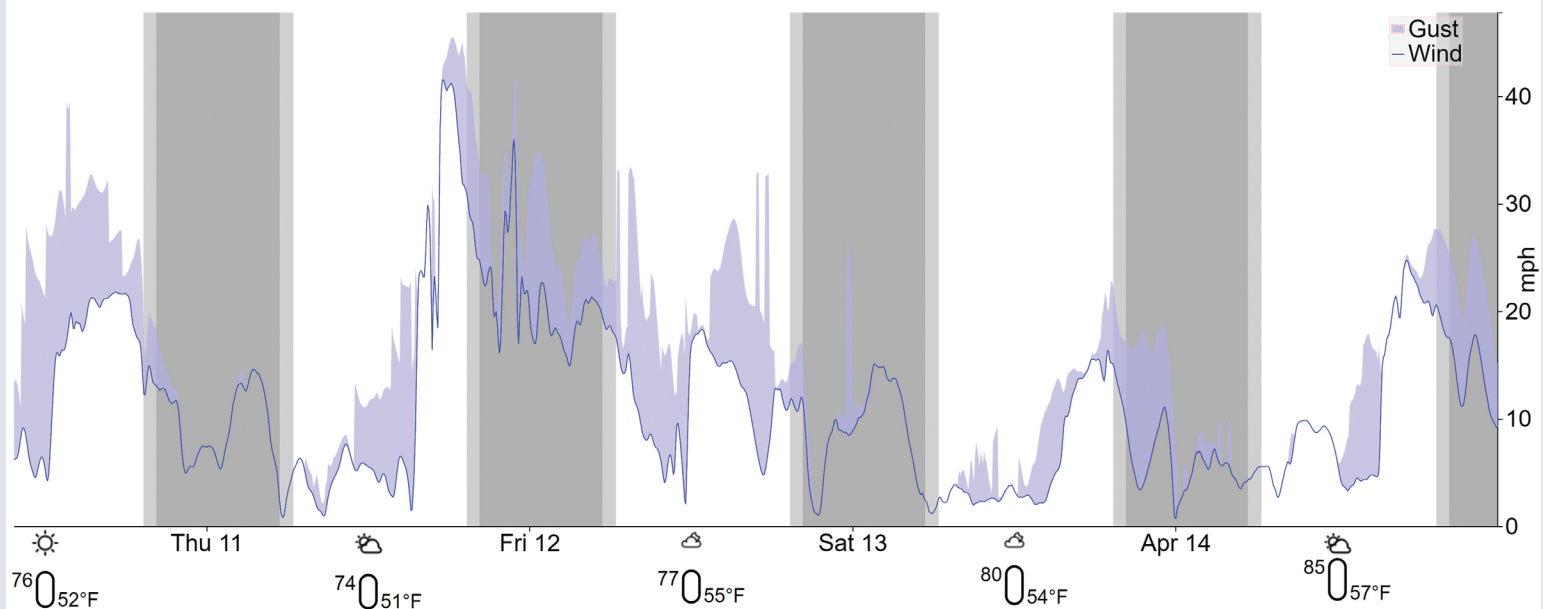
WHY DRI?

Long-established reputation for delivering customer-centric analysis and solutions with a balance of academic rigor and business pragmatics.

Recognized world leader in environmental sciences and engineering.

As a public agency of the State of Nevada, DRI serves stake-holders as an unbiased, neutral, and transparent leader.

WIND SPEED AND GUSTS, LOW AND HIGH TEMPERATURES AT 200 FEET ABOVE GROUND 5-DAY FORECAST —FORECASTS AVAILABLE FOR ANY HEIGHT—



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EXPLORE MORE AT DRI.EDU

“Mr. Crane has employed DRI’s crane forecasts for the past four years on a high-visibility R&D project involving critical lifts of very heavy loads with large surface area (~1,000 SF) highly vulnerable to the impact of winds. Our crews confidently rely on the forecasts, and the project reliably uses the data for precise scheduling and mitigating potential hazards. DRI’s crane forecasts greatly add to our margin of safety for planning and execution.”

CHARLIE THOMPSEN
MR. CRANE INC.
WWW.MRCRANE.COM

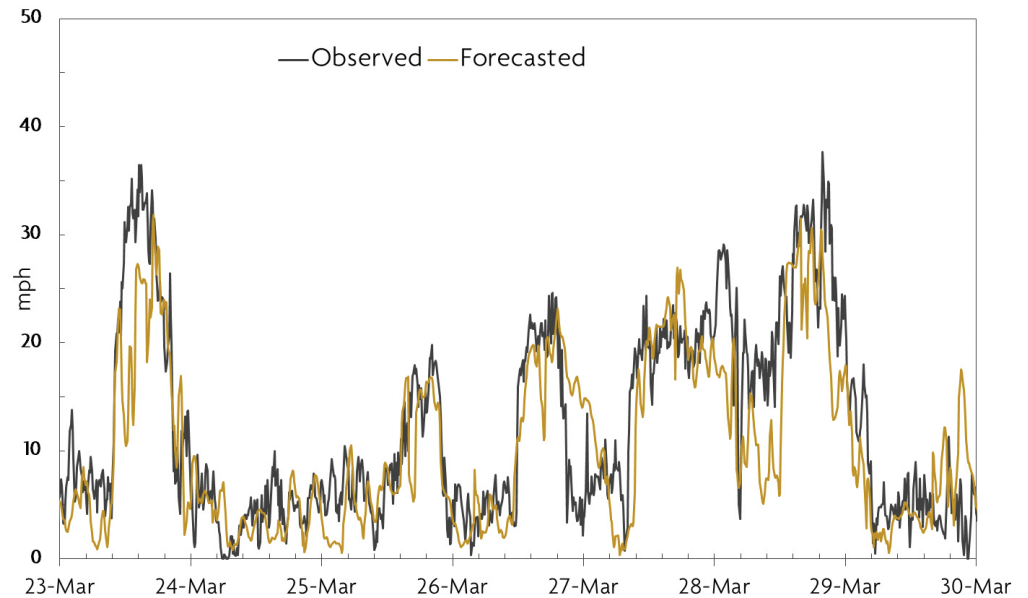
THE PROCESS...

Begins with the National Oceanic and Atmospheric Administration’s Global Forecast System (GFS). Twice daily, we downscale GFS using the Weather Research and Forecasting (WRF) model. WRF is operated by the National Centers for Environmental Prediction and has over 39,000 registered users.

We create a WRF model specific to each crane’s location and calibrate it using observed data from existing, nearby weather stations. In the calibration process, differences between forecasted and observed temperature, barometric pressure, and wind speed are compared and the model is adjusted until the differences are minimized. Calibration is continuous during operational use of the forecast engine to improve the accuracy of the forecast.

Our REMAS software displays the forecast on desktops or mobile devices.

COMPARISON OF OBSERVED WINDSPEEDS FROM EXISTING WEATHER STATIONS WITH OUR WRF MODEL’S FORECASTED WINDSPEED



WE CAN CUSTOMIZE

- Weather parameters & crane/job requirements in lift plans
- Managers see alarms, alerts, all cranes & crews in operation
- Crews see on-site, real-time forecast tailored to their crane & lift

WHY WE DO THIS

DRI faculty and staff working on weather forecasts for crane operations provide capabilities, experiences, and expertise in atmospheric, geologic, and hydrologic sciences as well as civil, geotechnical, and mechanical engineering. Our team evolves out of the Naval Earth Sciences and Engineering Program (NESEP), which serves as an organizational focal point for DRI’s services to the Department of Defense. The NESEP team has been delivering weather forecasts for heavy-lift crane operations twice a day, without interruption, since December 2016.