KrystalBall

Weather-Aware Work Planning for Field Teams

1. What is KrystalBall?

KrystalBall is a browser-based weather planning tool built for construction and field teams working in KSA. It pulls historical weather data from Open-Meteo's archive and gives you an hour-by-hour outlook for any location and week you're planning for.

It helps you answer one question before every work week: "Which hours are safe to plan outdoor work, and which hours need caution?"

2. Getting Started

Open the link shared with you in any modern browser (Chrome, Edge, or Safari). No installation or login needed.

Default view

When the page loads, you'll see a toolbar at the top with pre-filled coordinates (Riyadh area). The status section below says "Awaiting analysis" -- this is normal. You need to set your inputs and click Run.

3. Setting Your Inputs

Location (Latitude / Longitude)

Enter the coordinates of your tower or work site. You can get these from Google Maps: right-click any point and copy the coordinates.

Tip: Use the 'Around tower (3x3)' coverage to compare weather across nearby cells.

Planning Period (Year / Month / Week)

Select the year, month, and week number (1-4) you want to plan for. This tells KrystalBall which historical period to analyze.

Mode

- Historical average (default) -- averages weather data from past years for that week. Best for general planning.
- ML estimate (kNN) -- uses a k-Nearest Neighbors model to weight similar years more heavily. Try this if you want a sharper estimate.

Coverage & Cell Spacing

- Tower only (1x1) -- weather at the exact point.
- Around tower (3x3) -- a 3x3 grid of cells centered on your point. Recommended default.
- Larger corridor (5x5) -- for route or corridor planning (e.g., stringing spans).
- Cell spacing (2-15 km) -- distance between grid cells. 5 km is a good default.

4. Running the Analysis

Click the "Analyze" button (or "Run" in compact mode). KrystalBall will fetch data from the Open-Meteo archive. This

takes 5-15 seconds depending on grid size.

Once complete, you'll see several sections populate:

- Planning Call -- a top-level summary: Good / Caution / Adverse with color coding.
- Alert Boxes -- specific warnings for wind, gusts, heat, or rain if thresholds are breached.
- Hour-by-hour outlook -- a visual timeline showing conditions for each hour of the day.
- Hourly planning table -- detailed table with a recommended 9-hour work window highlighted.
- Around-tower comparison -- a grid map showing how weather varies across nearby cells.
- Planning context -- contextual notes about the selected period.

5. Reading the Results

Planning Call (Go / Caution / Adverse)

This is your headline. Green = conditions look safe for most outdoor work. Amber = some hours may be restricted (check alerts). Red = expect significant disruption.

Alert Boxes

Color-coded alerts appear when thresholds are crossed. Each box tells you what the risk is and how severe. Pay special attention to wind and gust alerts for crane and stringing work.

Hourly Table -- the 'Recommended' Column

The table highlights a recommended 9-hour work window where conditions are most favorable. Hours marked 'Recommended' are the safest to schedule critical outdoor tasks. Hours outside this window may still be workable but carry more weather risk.

Tip: Use the recommended window to schedule crane lifts, stringing, and concrete pours.

Around-Tower Comparison Grid

If you're using 3x3 or 5x5 coverage, this grid shows how conditions vary spatially. Green cells are good; amber/red cells have higher risk. Useful if your crew works across a corridor and you need to know which sections are safer.

6. Recommended Weekly Workflow

Use KrystalBall as part of your weekly planning cycle:

- Thursday/Sunday: Run analysis for the upcoming week (all 4 weeks if planning ahead).
- Set coordinates for each active tower or work front.
- Check the planning call and alert boxes -- flag any Caution/Adverse weeks to your CM.
- Use the hourly table to propose shift timings that avoid the worst hours.
- Export CSV (button in toolbar) to attach weather data to your weekly plan or email.
- Re-run mid-week if plans change or you need a different location.

7. Exporting Data

Click "Export CSV" in the toolbar to download a spreadsheet-ready file with all hourly data for the selected period. You can open this in Excel, attach it to reports, or share it with stakeholders who want the raw numbers.

8. Tips & Best Practices

- Bookmark the link for quick access -- no login needed.
- Morning is usually the best work window in KSA summer (lower heat, calmer wind).
- For stringing work, pay close attention to gust alerts -- sustained wind may be OK but gusts cause conductor sway.
- If the page shows an error, check your internet connection -- it needs access to Open-Meteo APIs.
- Works on mobile too -- share the link in WhatsApp for field supervisors to check on-site.
- The tool uses historical patterns, not a live forecast. It tells you what weather is TYPICAL for that week, not what will happen tomorrow.

9. FAQ

Does this show live weather?

No. It shows historical averages (or ML estimates) for the selected week. Use it for planning, not for real-time decisions.

Can I use it offline?

No. It fetches data from Open-Meteo's API each time you run analysis. You need internet access.

How accurate is it?

It reflects actual recorded weather patterns from past years. Historical average mode smooths out anomalies; ML mode preserves year-to-year variation. Neither is a forecast -- treat it as informed guidance.