RF Coverage Prediction Tools

Why Model Before Deploying

Walking a coverage area with a radio after installing a repeater is valuable ground-truth - but it is expensive if the site turns out to be wrong. Free online tools let you model RF line-of-sight and rough coverage before committing to an installation, saving you a wasted site visit and hardware move.

HeyWhatsThat (heywhatsthat.com)

HeyWhatsThat is the best free tool for quickly visualising the radio horizon from a specific point.

- Enter the coordinates (or click a map) and elevation of your proposed repeater site.
- The tool generates a panoramic view and a map showing all terrain that is geometrically visible from that point.
- Accounts for Earth curvature and terrain elevation using SRTM data.

Limitations: HeyWhatsThat does not account for buildings, vegetation, or local obstructions. It shows theoretical geometric visibility, not actual RF propagation.

Use case: Quickly screen potential hilltop sites before visiting. A site with a 360° clear horizon is worth investigating; a site blocked by higher terrain in key directions is a red flag.

Radio Mobile (radiomobile.ca)

Radio Mobile is a more advanced free tool aimed at amateur and community radio network planning.

- **Point-to-point path profiles:** shows the terrain cross-section between two points with Fresnel zone visualisation, so you can see whether the path is truly clear.
- **Coverage maps:** generate area coverage maps from a repeater site given your TX power and antenna height.
- Supports custom frequency, antenna gain, and receiver sensitivity input - LoRa parameters can be modelled directly.

Radio Mobile has a steeper learning curve than HeyWhatsThat but is much more capable for serious network planning.

SPLAT! (Amateur Radio Propagation Tool)

SPLAT! is an open-source Linux/macOS command-line tool for RF propagation analysis.

- Generates coverage maps using the ITM (Irregular Terrain Model) or ITWOM propagation model.
- More accurate than simple line-of-sight tools - accounts for diffraction over ridges.
- Requires downloading SRTM terrain data files for your region.

SPLAT! is best suited to serious network planners who are building a community mesh from scratch and need repeatable, scriptable coverage analysis.

Meshtastic Signal Mapper

Some community tools (including extras around meshmap.net) allow you to import Meshtastic position data and visualise actual observed coverage on a map. Where real-world data already exists, this is more valuable than any theoretical model. Check your regional Meshtastic community's resources for existing coverage maps before starting your own modelling work.

CloudRF / ORCA (Cloud-Based RF Planning)

CloudRF is a commercial service with a free tier that generates RF coverage maps using the ITM/Longley-Rice model.

- Can account for clutter (buildings, forest) in some calculation modes.
- Easy web interface: enter site coordinates, antenna height, frequency, TX power, and antenna gain to get a shaded coverage map.
- The free tier allows a limited number of calculations per month - sufficient for planning a handful of repeater sites.

CloudRF is a good middle ground between the simplicity of HeyWhatsThat and the complexity of SPLAT! for planners who want clutter-aware coverage maps without installing local software.

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