# 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's SRTM data is a digital *surface* model (coarse ~30 m resolution), so it partially includes building rooftops and tall canopy but cannot resolve individual buildings or trees. Treat its results as terrain-dominated geometric line-of-sight, not true RF coverage - it does not model actual RF propagation, diffraction, or local clutter.

**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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