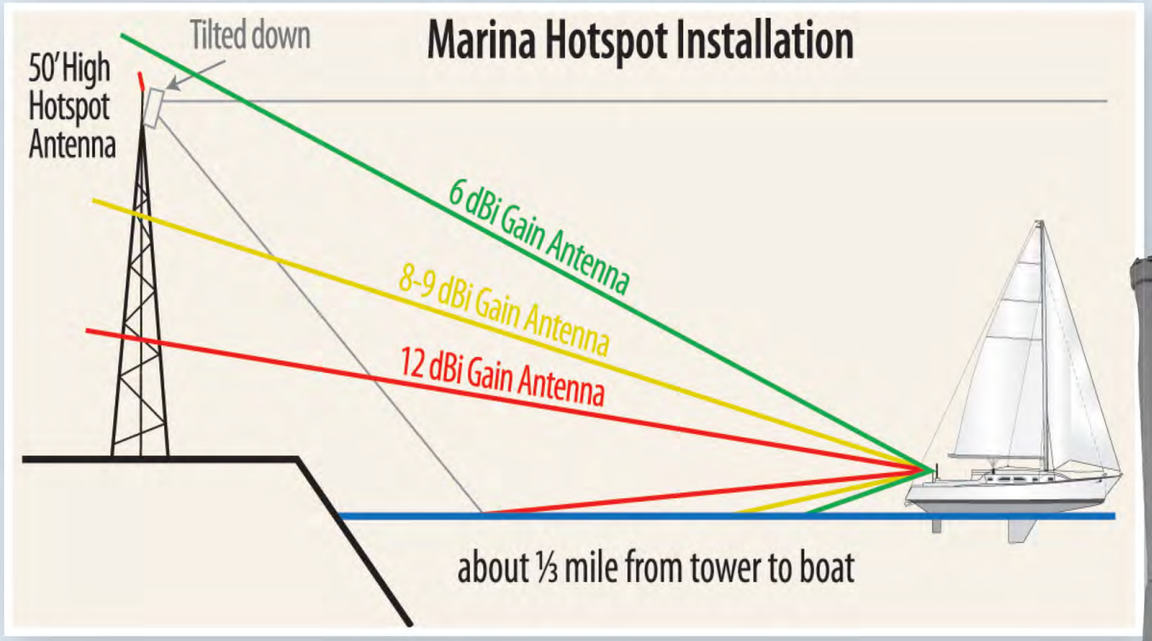
Ideal Performance Balances Gain and Environment



The Bad Boy Xtreme (6 dBi, left), the Rogue Wave (9 dBi, middle), and The Wirie (8.5 dBi, right) opt for broader omnidirectional radiating pattern to achieve reliable reception. The illustration above (adapted from one provided by Bitstorm) shows how a long-distance high-dBi antenna might not work as well when it is close under a marina transmitter.

The total effective radiated power of a transmitter is measured as Effective Isotropic Radiated Power (EIRP), and with regard to Wi-Fi devices, the Federal Communications Commission allows a maximum EIRP of 36 decibels over isotropic. This represents the sum of the power of the Wi-Fi device and any gain in strength at the antenna, minus signal loss in the line.

Almost every Wi-Fi antenna will deliver some degree of gain in the strength of the radiated signal. This gain, measured in decibels (dB) or sometimes decibels over isotropic (dBi), is usually achieved through a more directional radiation pattern. While a vertical antenna or whip is considered omni-directional, it radiates most of its signal in the horizontal plane and can still provide a respectable amount of gain. Most of the units on the marine market operate at or near the FCC's maximums, pairing a nearly 500- to 1,000-mW Wi-Fi device and a 6- to 9-dB antenna.

There are higher dB "yagi" antennas on the market, and in a static environment, these can have a greater potential point-to-point range. However, because the 2.4-GHz Wi-Fi frequency requires unobstructed line of sight for good transmission, a broader radiation pattern can be more effective in a cluttered environment like a marina or harbor. This is particularly true for boats, because they are unstable and tend to operates in different locations.