The most discussion of habitable planets has focused on Earth-like planets with globally abundant liquid water. For an “aqua planet” like Earth the surface freezes if far from its sun, and the water vapor greenhouse effect runs away if too close. Here we show that “land planets” (desert worlds with limited surface water) have wider habitable zones (HZ) than aqua planets. At the inner edge of the HZ, a land planet has two advantages over an aqua planet because: (i) an unsaturated air at the tropics emits longwave radiation at rates above the traditional runaway limit; and (ii) a dry stratosphere limits hydrogen escape. At the outer limits of the HZ, the land planet better resists global freezing because there is less water for clouds, snow, and ice. Here we describe a series of numerical experiments made using a general circulation model for Earth-sized planets. If other things (CO2, rotation rate, surface pressure) are unchanged, liquid water remains at the poles of a low obliquity land planet until net insolation exceeds 415 W/m² (170% of modern Earth), compared to 330 W/m² (135%) for the aqua planet. A low obliquity land planet freezes at 77%, while the aqua planet freezes at 90%. It is possible that, as the Sun brightens, an aqua planet like Earth can lose most of its hydrogen and become a land planet without first passing through a sterilizing runaway greenhouse. It is possible that Venus was a habitable land planet as recently as 1 billion years ago.