

FIGURE 151e-7 Trend of annually averaged global dengue epidemic potential (rVc). Differences in rVc are based on 30-year averages of temperature and daily temperature range. **A.** Differences between 1980–2009 and 1901–1930. **B.** Differences between 2070–2099 and 1980–2009. The mean value of rVc was averaged from five global climate models under RCP8.5, a scenario of high greenhouse-gas emission. The color bar describes the values of the rVc . (From J Liu-Helmerson et al: Vectorial capacity of *Aedes aegypti*: effects of temperature and implications for global dengue epidemic potential. *PLoS ONE* 9:e89783, 2014 [doi:10.1371/journal.pone.0089783].)

accuracy in predicting current *I. scapularis* distribution and suggests substantial expansion of tick habitat and consequently of populations at risk for the diseases this tick transmits, particularly in Quebec, Iowa, and Arkansas, by 2080. Of note, some areas on the Gulf Coast may become less suitable for ticks by the end of the century.

WATERBORNE DISEASE

Outbreaks of waterborne disease are associated with heavy rainfall events. A review of 548 waterborne disease outbreaks in the United States found that 51% were preceded by precipitation levels above

the 90th percentile. Since 1900, most regions of the United States except the Southwest and Hawaii have experienced an increase in heavy downpours (Fig. 151e-9), with the greatest intensification of the water cycle in New England and Alaska. Climate models suggest that by 2100 daily heavy-precipitation events, which are defined as a cumulative daily amount that now occurs once every 20 years, will increase nationwide (Fig. 151e-10). This scenario may be from two to as much as five times more likely, depending on the extent of greenhouse gas emission reductions achieved early in the twenty-first century.

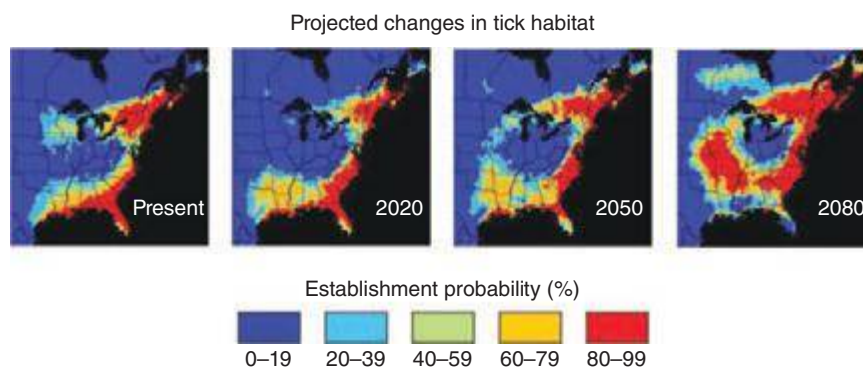


FIGURE 151e-8 Present and projected probability of establishment of *Ixodes scapularis*. (From U.S. National Climate Assessment 2014, adapted from JS Brownstein et al: Effect of climate change on Lyme disease risk in North America. *Ecohealth* 2:38, 2005.)