Street trees provide ecosystem services that counter negative effects of cities on human and environmental health. Unfortunately, herbivorous arthropod pests are often more abundant on urban than rural trees. We ask how urban habitat characteristics influence temperature and natural enemy abundance, in regulating the abundance of an urban forest pest, the gloomy scale (*Melanaspis tenebricosa*). Impervious surfaces lead to warmer tree canopy temperatures, which increase scale insect abundance by increasing their fecundity, contributing to greater rates of population growth. This suggests that future warming may have direct effects on herbivorous pests, leading to declines in urban forest health.
Photo 1. Red maple street trees in southeastern U.S. cities are often heavily infested with gloomy scale insects. Here, a red maple heavily infested with gloomy scale is exhibiting significant branch dieback throughout its canopy. This is a gradual decline in condition, which can lead to tree failure.
Photo 2. A red maple branch heavily infested with gloomy scales (identified by the small bumps covering the bark). Not only do heavily infested trees decline in condition and appearance, but they likely contribute less services to the environment and people that live around them.
Photo 3. If the test (cover) of the gloomy scale is removed, the soft-bodied insect (~1 mm diameter) is revealed residing beneath. These sedentary insects spend the majority of their life under this cover, where they extract nutrients from woody tree tissue.
Photo 4. Gloomy scale insects are more abundant on red maples in the warmest parts of the city. We found that this is partly explained by a 300% increase in gloomy scale egg production. Here, eggs cells have been dissected from an adult female and embryos (S-shaped lines) are visible developing within them just weeks before giving live birth.

These photographs illustrate the article “Urban warming trumps natural enemy regulation of herbivorous pests” by Adam G. Dale and Steven D. Frank, tentatively scheduled to appear in Ecological Applications 24(6), September 2014. [http://dx.doi.org/10.1890/13-1961.1](http://dx.doi.org/10.1890/10.1890/13-1961.1)