Use Case:
Cooling Study Looks at Benefits of Urban Green Spaces in the Face of Climate Change

Problem

Due to climate change, extreme heat is now the leading cause of weather-related deaths. And nowhere is extreme heat in the United States more extreme than in our cities, where about 80% of our population resides. Cities are essentially heat islands, defined by the US Environmental Protection Agency as “urbanized areas that experience higher temperatures than outlying areas,” with daytime temperatures up to 7°F higher and nighttime temperatures up to 5°F higher than outlying areas.

To better understand the role that green spaces (including parks, wetlands, and grasslands) play in helping to cool cities, the Natural Areas Conservancy (NAC), New York City’s leading nonprofit dedicated to studying and helping to care for the city’s 20,000 acres of forests and wetlands, recently undertook a cooling study involving 12 cities in its Forests in Cities Network. After researching temperature monitoring options to be used in the study, NAC’s deputy director reached out to the HOBO data logging experts at Onset for an affordable, reliable solution that would stand up to outdoor conditions, including rain, wind, and solar radiation.

Solution

One of Onset’s HOBO data logging experts recommended the compact, weatherproof HOBO MX2304 External Temperature Sensor Data Logger, a Bluetooth-enabled logger that lets users within a 100-foot range download data wirelessly to a mobile device or Windows laptop running Onset’s free HOBOconnect app. This allows for deploying the logger in hard-to-reach locations, such as trees, without users having to physically access the logger to access the data. An RS3-B Solar Radiation Shield for high-accuracy air temperature measurements in locations exposed to sunlight was also recommended to complete the rugged, reliable, precise solution the NAC was seeking.

Read results on reverse

Results

After receiving the HOBO MX2304 loggers and radiation shields, the NAC mounted the sensors in the shields, configured the loggers to measure and record temperature at 5-minute intervals, and shipped packages of nine loggers and shields to each of the 12 Forests in Cities Network locations participating in the study, including Baltimore, Houston, Seattle, Indianapolis, and Miami. Along with the monitoring equipment, the NAC provided each city with a written protocol describing how to deploy the sensors in trees at heights of 7 to 10 feet, how to download the HOBOconnect app to mobile devices or Windows laptops, and how to upload the data to HOBOlink, Onset's cloud-based software platform. The NAC also deployed loggers at its own local parks: Clove Lakes Park in Staten Island, Forest Park in Queens, Seton Falls Park in The Bronx, and Central Park in Manhattan.

Since the loggers were first deployed in early June, monthly data syncs have been done and will continue through the early fall. And with Forests in Cities Network staff wirelessly downloading data from the loggers deployed in their respective cities and uploading the data to HOBOlink in the cloud, the NAC's data manager can easily view and analyze temperature data from the entire study area. The NAC research team anticipates that this temperature data will demonstrate the cooling benefit of green spaces in urban areas, as climate change continues to impact our environment.

> *The Bluetooth functionality of the HOBO MX2304s means our city teams don't have to climb trees to manually download data from each logger. Plus, with HOBOlink, while we have sensors all across the country, we have just one person managing all of the data.*
>
> *- Clara Pregitzer, Deputy Director of Conservation Science, Natural Areas Conservancy*

Products Used

Product	How it was used
HOBO MX2304 Temperature Data Loggers	To measure and record air temperature in urban natural areas
RS3-B Solar Radiation Shield	To improve temperature measurement accuracy in locations exposed to sunlight
HOBOconnect mobile app	To wirelessly download temperature data when within 100 feet of the logger
HOBOlink	To remotely view and analyze collected data from all participating research sites