OPPORTUNITY
What portion of water consumed by office buildings goes to irrigation?

TECHNOLOGY
How do Weather Stations for Irrigation Control work?

M&V
Where did Measurement and Verification occur?

RESULTS
How did Weather Stations for Irrigation Control perform in M&V?

USE LIVE LOCAL WEATHER DATA
TO CALCULATE IRRIGATION NEEDS, EITHER AS A TURNKEY SYSTEM OR CONNECTED TO A BUILDING AUTOMATION SYSTEM (BAS)

For more information, please visit: www.gsa.gov/gpg

GPG FINDINGS
The GPG program enables GSA to make sound investment decisions in next generation building technologies based on their real world performance.

20% OF WATER IN U.S. OFFICE BUILDINGS IS USED FOR IRRIGATION

UP TO 50% WASTED with timer-based irrigation

20-40% CAN BE SAVED with smart irrigation, depending on climate, soil, and vegetation profile

USE LIVE LOCAL WEATHER DATA
TO CALCULATE IRRIGATION NEEDS, EITHER AS A TURNKEY SYSTEM OR CONNECTED TO A BUILDING AUTOMATION SYSTEM (BAS)

PACIFIC NORTHWEST NATIONAL LABORATORY assessed a weather station provided by Campbell Scientific and connected to a BAS at the Hart-Dole-Indouye Federal Center in Battle Creek, Michigan.

FURTHER RESEARCH
CONNECTING WEATHER STATIONS TO BAS NEEDS MORE SUPPORT
Meanwhile, turnkey weather-based systems recommended.* Areas with intermittent rain will have higher savings and should be targeted first.

Life-Cycle Cost Analysis for Smart-Irrigation Systems

<table>
<thead>
<tr>
<th>Water Rate ($/kgal)</th>
<th>Installed System Cost 20% savings</th>
<th>Installed System Cost 40% savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.0 Mgal/yr</td>
<td>$10,000</td>
<td>$8,000</td>
</tr>
<tr>
<td>2.0 Mgal/yr</td>
<td>$15,000</td>
<td>$12,000</td>
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</table>

Installed System Cost

Assuming 40% savings

Installed System Cost

Assuming 40% savings

<table>
<thead>
<tr>
<th>System Cost ($10,000)</th>
<th>Water Rate ($/kgal)</th>
<th>Savings-to-Investment Ratio</th>
<th>Cost-effective when greater than 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>$10,000</td>
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<td>3.33</td>
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</tr>
<tr>
<td>$15,000</td>
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</table>

DEPLOYMENT
Where does M&V recommend deploying Weather Stations for Irrigation Control?

Further Research
CONNECTING WEATHER STATIONS TO BAS NEEDS MORE SUPPORT
Meanwhile, turnkey weather-based systems recommended.* Areas with intermittent rain will have higher savings and should be targeted first.

*Assessment of Weather Station Used for Irrigation Control: Hart-Dole-Indouye Federal Center, Battle Creek, MI, KL McMordie, Stoughton, RS Butner, PNNL, November 2014, p. 3

Ibid, p. 3

Ibid, p. 3

Ibid, p. 8

Ibid, p. 6

Subject to evaluation and approval by GSA-IT and Security