Covering building exteriors with vegetation has increased in popularity due in part to a desire to conserve energy and improve the environmental performance of buildings.

Placing living vegetation in close proximity to building surfaces:

- Cools them by reducing their solar heat load,
- Decreases their demand for electric power,
- Slows storm water runoff,
- Provides wildlife habitat,
- Quiets urban noise levels,
- Filters city air pollution and mitigates the urban heat island effect.

While research on the thermal and hydrologic benefits of green roofs in North America has been accelerating, research on these types of benefits for green walls has lagged. If green wall technology and its commercialization are to expand in North America, then research that quantitatively assesses these benefits is needed. As an immature industry there is also a need to identify plant varieties that exhibit better thermal and hydrological properties.

**Green Wall Experiment Underway**

Researchers in the Ecosystem Engineering Design lab of the Environmental Science and Technology Department are conducting experiments in Maryland to quantify the energy balance of green walls, green roofs, and vine canopies to determine how much effect they have on the surface and indoor temperatures of buildings. In addition the engineers are quantifying how much green walls can reduce the ‘urban heat island effect’ and how much less water runs off a building site that is covered by a green wall.

The ecological engineers will develop mathematical models, based on their experiments, that can be used to design green buildings and estimate energy savings. Vegetation of a green wall cools a building by reflecting solar radiation and by transforming absorbed solar radiation into water vapor via transpiration. As part of their research the ecological engineers will measure the reflectance and transmittance of vine species used on green walls, which will provide critical information for quantifying the differences among plant species on their ability to cool buildings.