Campus RainWorks Challenge Video Transcript
for Columbia University Design Team

Narrator: We are the Columbia University Aquanauts, and New York City is our home. With a population of over 8 million, New York City has an extensive sewer system. But when it rains, the system can be overwhelmed by stormwater, resulting in untreated sewage and contaminated rainwater overflowing into New York's waterways. One of the worst examples of this in recent times was on September 16, 2010, when the Gowanus Canal became coated in raw sewage following a storm.

Mayor Michael Bloomberg has a comprehensive plan to begin tackling this issue. But the plan's success would require new solutions to a decades-old problem. That is why the Columbia Aquanauts have designed an innovated stormwater management system. On the Columbia campus, just behind the Mudd engineering building, there is an empty and rarely-used terrace. We envision this terrace becoming a space with two functions: to be part of New York City's efforts to manage stormwater, and to create a space for students to enjoy.

This is what we envision the finished terrace will look like, with an aesthetic glass structure in the middle alongside a decorative fountain. There will be ample seating areas all around the space. Overhead, a structure of vines will play a key role in the stormwater management system. The basic concept of this system is to capture as much water as possible and release it into the atmosphere through vines. When it rains, water first is harvested in the tank. This water is then used to irrigate the soil, before finally returning to the atmosphere through the vines. The interactions between the components in this process are controlled by a regulatory system, which makes decisions based on real-time data.

Let's assume the system sees that rain is forecasted in the next couple of days. Based on the current water level, the system calculates that there is an insufficient storage space in the tank for the incoming rainwater. The system sends a signal to release water from the tank into the sewer system. This happens well before the storm hits, so that the water does not contribute to the combined sewer overflow. Once the storm is imminent, the system lights a sign, notifying passers-by that any water use, such as dishwashing and laundry, could directly pollute the nearby Hudson River. As the storm passes, the time updates, letting users know of a more ecologically responsible time to use water. When forecasts show clear weather, the system uses soil moisture data to optimize the rate at which the plants return water to the atmosphere.

Dr. Patricia Culligan: By storing the water on site and then releasing it to the environment when it's not raining, you manage to almost double the stormwater benefits that this green infrastructure intervention has vis-à-vis something like a green roof.

Narrator: Beyond the environmental benefits, the system would also provide a social setting for students and faculty.

Dr. Patricia Culligan: So I think inter-mixing a green infrastructure intervention with a space that people can gather is really smart.

Nelson E. Dove, Graduate Student: You get the opportunity to sit out there and talk, take a break from your studies, or have a meet-up place before or after class.

Aine Chalmers, Undergraduate Student: It's a nice break from city life. Sometimes being in the city and going to school at Columbia, you forget what it's like to be immersed in nature.

Robert Elliott, Graduate Student: Taking this thing, this stormwater, that's normally a negative thing that becomes runoff and pollution, and instead you're taking it and using it to create more life.