

Use Case: Understanding Wetland Water Movement

Problem

Knowing that accurate water level and flow monitoring data is key to protecting valuable wetland habitats, a conservation organization in Illinois set out to monitor water levels in a 65-acre wetland area that includes a 15-acre lake. The group wanted to understand how the wetland/lake area was responding to atmospheric conditions, which directly affect wetland performance. To get the necessary data, the group determined they would need to monitor various weather parameters, in addition to monitoring water levels of the incoming stream, the lake, and the wetland. They also wanted to be able to view data remotely (especially during storm events) to know when water samples needed to be collected. After learning that most systems that monitor both water levels and weather are very expensive, complicated, and difficult to configure, the researcher in charge of the project reached out to Onset for a simpler, more economical solution.



Solution

Working with an Onset application specialist, the researcher determined that the project's goals could be accomplished using three [HOBOMicroRX Water Level Stations](#). The affordable, award-winning MicroRX station offers a compact, integrated solution for monitoring at each of the three locations – the stream, the lake within the wetland, and the wetland itself. With cellular communication capability to directly feed data to [HOBOLink](#), Onset's cloud-based software platform, the station enables users to create their own dashboards, access data, configure automatic text/email alarms, and view current trends in graphs – all by utilizing any device with an internet connection. The MicroRX station is also equipped with an integrated barometric pressure sensor and a low-maintenance non-vented water level sensor, and has five inputs for plug-and-play sensors to monitor weather parameters such as rainfall, solar radiation, temperature, and humidity.

The researcher and his team deployed the MicroRX stations at the three locations, with the water level sensors mounted in stilling wells. They also set up sensors to measure rainfall and incoming stream flow, the most significant factors affecting the amount of water coming into the wetland area. Additional sensors, to measure temperature, humidity, and light, provided the inputs for HOBOLink to automatically calculate the amount of water evaporating through evapotranspiration (ET).

► *Read results on reverse*

Results

Following the first major rainstorm, data collected by the station at the lake showed that the water level had increased by almost 5" in less than ten hours, while the accumulated rainfall at the lake was 2.8" for the same time period. Given the size of the wetland area that's feeding the lake, the team knew that a 2.8-inch rainfall would ordinarily create a lake rise in excess of five inches. Because of the station data, however, they were able to conclude that the wetlands absorbed a significant portion of the rainfall, thereby having a significant positive impact on the area's ecosystem. The team also found it very helpful to have the ability to view the climate conditions and water level data together on the same dashboard, and to download the data from the three stations as one data file for in-depth analysis in a statistics program.

Using HOBOLink, the research team also set up automatic alarm notifications in order to be alerted by text and/or email when more than 0.5" of rainfall occurs in a four-hour period. The notifications let them know exactly when to go to the site to collect water samples that will be tested due to concerns about the possibility of fertilizer residue from nearby agriculture fields getting into the runoff. With HOBOLink, the team can also monitor the wetland in real time, and they found it very easy to use the HOBOLink feature that automatically calculates stream flow from water level data.

We really appreciate being able to monitor this wetlands site remotely, as it is a 30-minute drive from our office. This saves the time of having to go to the site to offload the data manually, and we get alarm notifications to let us know when to go to the site to collect water samples.

– Frank R., Professor of Environmental Science

Products Used

Product	How it was used
HOBO MicroRX Water Level Station, with rain, temp/RH, and solar radiation sensors	To monitor water level, flow, and weather conditions at a 65-acre wetland area
HOBOLink, Onset's cloud-based platform	For remote access to monitoring data, and automatic alarm notifications via text or email should conditions exceed user-set thresholds

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