



Hydromet Cloud Case Study - Thompson's Mills State Heritage Site



Picture 1. Map courtesy of Oregon State Parks



Picture 2. Thompson's Mill, photo courtesy of Oregon State Parks

Background

Thompson's Mills is a unique survivor of times past, chronicling 150 years of Oregon rural life and honoring the owners who adapted the mill to the changing world around it. It is the last water-powered mill in the state and its turbines can be seen in action today. This is possible due to the intricate system of waterways, dams, and control gates that allow water flowing from the Calapooia River to pass through the millrace in order to run the milling machines for demonstrations.

The Mill is built on a side channel of the Calapooia River which is an active waterway. During the winter, when the majority of precipitation occurs, the gates located where the side channel and river merge control flows to maximize drainage for upstream farms and maintain the required water level for nearby fire hydrant intakes. Versus during summer months an adjustable weir is raised forming a pond to retain necessary water for the Mill, while allowing natural flows on the river without the use of structural dams.

What is monitored / Why monitor

Currently, water level is monitored at one station and by the Fall of 2017, at two stations, to inform decisions on how to manage the gates in order to maintain water level. The side channel has a 1-2 ft.



Picture 3. Hydromet Cloud Custom Reports

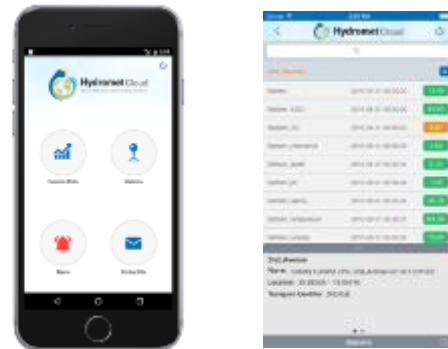
threshold range for water level fluctuations. It is critical to maintain the water level inside this range to permit the best drainage for farms upstream and to avoid basement flooding at the Mill site. The challenge occurs during the winter months when rain events in the Cascade foothills to the east and the Willamette Valley floor to the south send pulses of water into the Calapooia River. Essentially if it rains there is a 24 to 36-hour time window before a precipitation related surge of water can be observed at the Mill site. For this reason, it is necessary to continuously monitor water level and view data as often as possible during rainy periods. Tom Parsons, with the Oregon State Parks described the need as, "Cannot emphasize enough how much we're watching the graphs"; referring time series graphs illustrating water level trends. Up to the minute data is needed and to check if a surge has passed. During the evenings data can be viewed via a smart phone using a mobile App.

The following describes collection of water level measurements at the Mill:

- Monitoring station with two water level sensors and measurements taken once per minute
 - Water level sensor installed in the millrace in front of the mill
 - A second sensor in the tail race, behind the mill to watch for basement flooding

Monitoring Solution

- Two Sutron pressure level sensors measuring water level every minute
- Sensors connected to Sutron 9210 data logger collecting measurements and transmitting data every minute via static IP address
- Hydromet Cloud ingests data and hosts data on webpage and mobile App
- Hydromet Cloud website and mobile app used for checking current conditions and 2-12 hour trends



Picture 4. Hydromet Cloud Mobile App.

Advantages

Having the time series graphs available via the web on HydrometCloud.com illustrates water level trends, and as Tom stated, "It has been the most helpful thing", as it allows the site managers to know if the critical 1-2 ft. fluctuation range could be exceeded. During very high water flows the Mill rangers can close the head gates so water does not flood the basement of the mill, rather the water in the mill race backs up and temporarily raises levels upstream and flows through a bypass channel. The time series graph can be used to show those upstream neighbors why the water was temporarily backed up and how that helped prevent damage at the mill.

Summary

In conclusion, the products and data management services offered by Sutron and OTT Hydromet play a critical part in the maintenance and safety of Thompson's Mill. With Hydromet Cloud, they are able to view their current conditions and trends using the website or app. Allowing them to effectively control water level and inform decisions on how to manage the gates in order to maintain critical water level thresholds.

For more information on the Thompson's Mill and their monitoring site, please contact Tom Parsons at:

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[Additional information on the Heritage Site](#)