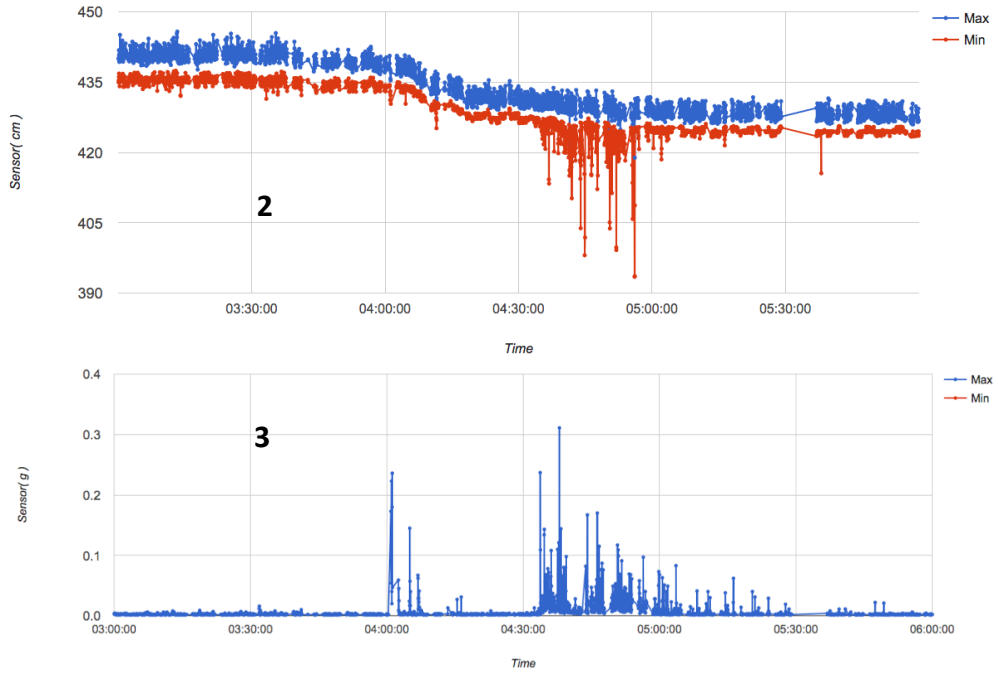



## Ice Strike Detection

APPLICATION

Objects striking piers can result in structural damage to a bridge. These strikes can go undetected along with the damage caused by the strike.

SENSORS

For this application accelerometers are a good choice as they are more sensitive to the rapid change in position produced by a strike. This is true even in a stiff structure such as a bridge pier. A typical installation is shown in Figure 1, where an accelerometer and several other sensors have been mounted on a bridge pier cap. In this case a water level sensor has also been installed, but is not shown. A water level sensors is not required, but can provide additional information about the strike.

EXAMPLE EVENTS

In Figure 2 the water level meter shows the presence on objects in the water flowing under the bridge. As this was during the spring melt these were attributed to ice rafts that form during the spring melt. The ice at this location can be up to 1m thick and when a large raft strikes the pier it produces significant acceleration on the pier cap. In this example the majority of the rafts are passing between 4:30 and 5:00. The strikes produce accelerations as high as 0.3g (See Figure 3). This is well above the accelerations produced by traffic, such as that seen from 3:00 to 4:00. Due to the difference between traffic induced accelerations on the pier and that due to a large strike it can be easily thresholded for alarming.