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A simple and flexible device for housing water monitoring sensors at point discharges

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The Water Monitoring Enclosure (WME) provides a simple and flexible housing for measuring many types of water parameters (physical, chemical, or biological). The WME ensures a minimum water level to allow the devices to be continuously inundated even during periods when there is no flow entering the enclosure. The limited diameter of the inflow pipe and water volume in the WME buffers the flow velocity from dramatic changes. The device ensures that the sediment entering the enclosure from the inflow will be conveyed through the enclosure with minimal sediment accumulation. The device is powered purely from natural hydraulic forces, so it requires no power source, and requires little additional maintenance beyond occasional cleaning. If desired, the WME can also measure discharge entering the device through additional modifications. Water samples were taken throughout the year to validate the effectiveness of the WME. The differences of the receiving water to the water in the WME for all parameters were below the laboratory analysis standard error. Two design limitations were found during the assessment period. First, if the receiving water has a very low sustained discharge (< 0.04 l/s) and a high fine sediment load (> 100 mg/l) then the frequency of the flushings are not capable of continuously removing the sediment and a gradual accumulation of sediment of up to 2 cm per week can occur. A smaller volume of water within the WME would reduce the accumulated sediment due to very low discharges from an increased frequency of the flushings. Second, precipitated chemical solids can cause the mechanism to seize if not regularly cleaned.