

Runoff Monitoring and Water Sampling Within the Stepler-South Tobacco Creek WEBs Watershed Project

The photo on the left shows one of the many runoff and water sampling sites located throughout the Stepler Watershed (identified on the map as Ms sites [MAP](#)). Flow is monitored using a circular flume composed of a one-meter horizontal pipe with a 300 mm pipe inserted perpendicular to the horizontal pipe. An ultrasonic depth meter connected to a data logger, mounted on top of the 300 mm pipe, is used to track the water level. The data logger records the water level and activates an auto-water sampler. Water samples are collected throughout the runoff event. The data logger, auto-sampler and solar-power supply are located in the small shed.



Auto-water sampler and data logger located in shed.



Outflow from a circular flume.



Water levels in the two small reservoirs, Madill and Steppler ([MAP](#)), are monitored using electronic water-level recorders. The levels are used to calculate the inflow and outflow rates, using reservoir-routing software in conjunction with the physical parameters for each reservoir. Auto-water samplers located at the upstream end of the reservoirs are used to take water samples. Outflow samples are taken manually.



Runoff is monitored at several sites in the Stepler Watershed (Ms 10, 11 and 5 [MAP](#)) using V-notched weirs. The depth of the water flowing over the weirs is monitored using an ultrasonic depth meter connected to a data logger. The data logger is used to activate an auto-water sampler, which collects samples during runoff events.



Photos on the left and below show the collection of trash or surface material from several of the project sub-watersheds (fields F3, F4, F10 and F11 [MAP](#)). The material is collected just before snowfall and after the producer has completed tillage. The photo on the left shows the collection of material from a forage field while the photo below shows material being collected from a cultivated field. The collected material is cycled through a freeze/thaw process (as it naturally would be) and then water is passed over the material. The water is then analyzed for various forms of nitrogen and phosphorous.





Soil samples are collected from fields F3, F4, F10 and F11 (**MAP**) for various depths and defined transects. Sampling is repeated at the same location every year to determine if there are any changes in soil nutrients. Soil sampling is carried out in the fall after harvest.



Photos to the left and below depict the coring of the snow pack to obtain snow samples. Sampling is carried out in fields F3, F4, F10 and F11 (**MAP**) on defined transects which can be replicated each year. The samples are assessed for water and nutrient content. Water content, along with a snow survey, is used to estimate runoff potential from fields F10 and F11 (**MAP**).





Photos to the left and below depict the data collection sites for soil moisture and climate information. Soil moisture data is collected throughout the growing season in fields F10 and F11 (**MAP**). Climate data includes rainfall depth (on a continuous basis) at two locations (monitoring sites Ms10 and Ms4 **MAP**). Air temperature data is also collected at monitoring site Ms10 (**MAP**). In addition to the continuous rain gauges, producers within the South Tobacco Creek Watershed record daily rainfall depths at their farm sites.

