Indianfarm Creek Watershed News

Fall 2010

A SOIL BIOENGINEERING UPDATE!

The Indianfarm Creek Watershed Group, in partnership with Alberta Agriculture and Rural Development and the Alberta Conservation Association, initiated two bioengineering projects on Indianfarm Creek this spring. The first project was completed in April on the main stem of Indianfarm Creek by Helping Hands Services, a contractor from Drayton Valley. Helping Hands Services installed sediment stops, which are biodegradable filtration systems made of a 70% straw and 30% coconut-fiber matrix and is reinforced with 100% biodegradable netting. This is rolled to create a highly effective, temporary, three-dimensional, sediment filtration system. Wattle fences, made out of wood board and live cuttings, were also installed during low flow this spring. The first project withstood the higher than normal precipitation amounts and high flow events this spring, and had great vegetative establishment success! However, a small area on the slope slumped causing some of the bioengineering structures to slide down slope. Also, the high flows caused some live cutting losses (which we hear the beavers downstream thoroughly enjoyed!). Grumpy's Landscaping Ltd. has been hired to repair these damages this fall.

The second project, located downstream from the first project (about 1 km), did not stand up to the high flows as well as the first. This work was done by Alberta Agriculture staff along with the help of the landowners. After numerous fixes due to high precipitation events, the damages caused by the large flood event of June 17 convinced us to clean the site and redo the bioengineering. Grumpy's Landscaping Ltd. was selected to stabilize the site using soil bioengineering techniques. This work will be completed this fall with the funding received from the Alberta Stewardship Network and the Alberta Conservation Association on behalf of the Indianfarm Creek Watershed Group. If anyone from the Watershed is interested in seeing the soil bioengineering in progress or the finished projects, please contact Taren Cleland (ARD) at 403-381-7109.

Project 1

March 1 – selected site prior to project establishment

April 30 – live stakes were planted and a reclamation grass seed mixture was spread over the entire site – species used were red osier dogwood, willow, cottonwood and prickly rose

September 1 – vegetative establishment

Indianfarm Creek Watershed Group Meeting – Fall 2010

Plans are underway for the fall 2010 watershed meeting and we are asking for your input into topics and speakers for the fall group meeting.

Suggestions for dates and topics can be made to:

Lynda Miedema, 403-381-5765, lynda.miedema@gov.ab.ca

Government of Alberta

Bioengineering Field Day

Alberta Agriculture staff, along with the knowledge of Helping Hands Services, hosted a Bioengineering Field Day earlier this spring. Approximately 12 members of the Indianfarm Creek Watershed Group attended and representatives from Alberta Conservation Association and Alberta Environment also participated. This group got to see soil bioengineering in action and participated in the preparation and installation of sediment stops. A special thank you goes out to Gordon Hoffman for allowing us to host the field day on his property!

Do it yourself... Soil Bioengineering!

Bioengineering techniques are like an art form and these sites are not easy to plan and implement. It may not be in your scope to install wattle fences or sediment stops. As a landowner however, there are other options you can use to help fix an eroded stream bank that flows through your property. Just simply going out into your yard and doing some pruning in the riparian areas or any place where you have trees and shrubs growing on your property can do wonders! Live staking is perhaps the simplest form of soil bioengineering. It involves using live cuttings of pioneering woody species, particularly those that are native to your watershed like red osier dogwood , willow , cottonwood and prickly rose. The cuttings need to be inserted into the soil in the spring when they have not budded out yet or in the fall after the leaves have fallen off. The cuttings used should be free of all branches, be cut to the diameter of your thumb width, and about 1 meter in length. They should be inserted into the soil (buds pointed up!) so that at least 3/4 of the cutting is underground. On drier slopes, 7/8 of the cutting should be inserted. You can plant them any way you like, vertically or diagonally as long as the cutting will remain moist over some of its length. In tougher soils, such as clays where it may be hard to plant the cuttings, you may trim the cutting to maintain the 3/4 or 7/8 burial, as long as the cutting is at least 40 cm (0.4 meters) long. For better success in establishment, soak your cuttings for a couple of days before you plant them. As the cuttings grow during the summer, the roots serve to bind the unstable stream banks which will lead to reduced erosion, stream sedimentation, improved water quality, and creation of wildlife habitat.

Example of an established live cutting

Happy Bioengineering!

"A River Runs Through It" in Indianfarm Creek

Indianfarm Creek literally became a river during the June 2010 event. The flow in IFC peaked around midnight on June 17 with a water height reading of 227 centimeters. Flow metering on June 18th was done when the water level was at 130 cm and flow at this time was 37 cubic meters per second (m^3/s), which was approximately three times greater than the flow event in June of 2008. The rainfall runoff flows in the creek during this event were actually greater than during event base flows in the Oldman River near Brocket, e.g. the flow in the Oldman River was 27 m^3/s at 6:30 am on September 16, 2010 (Alberta Environment website, 2010). These flows were quite remarkable for a small agricultural watershed!

Indianfarm Creek outlet into Pincher Creek


Outlet – March 8, 2010

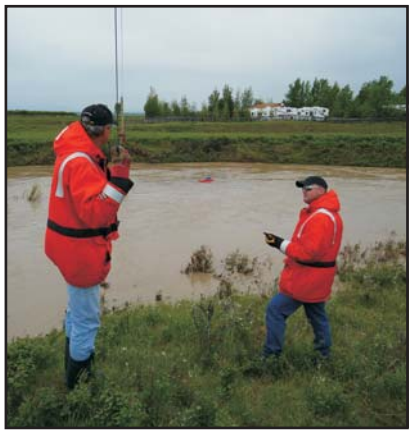

Outlet – June 18, 2010

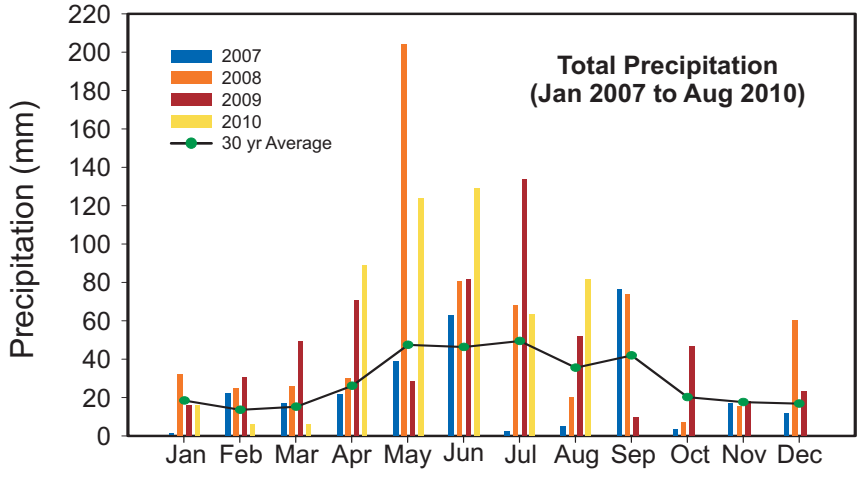
What is "Normal" Anyway?

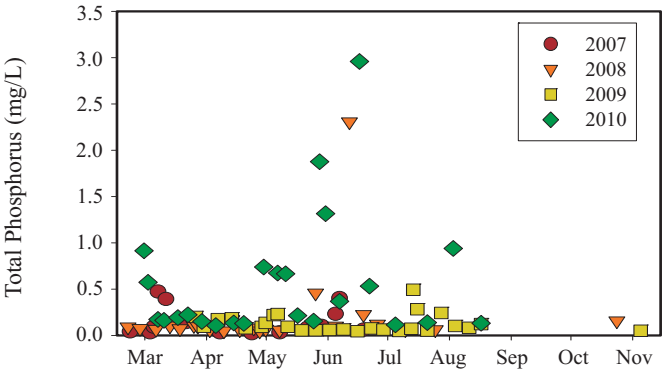
So, what is "normal"? When we talk about climate "normals", comparisons get made between the climate data for the current year and an average of climate data for previous years.

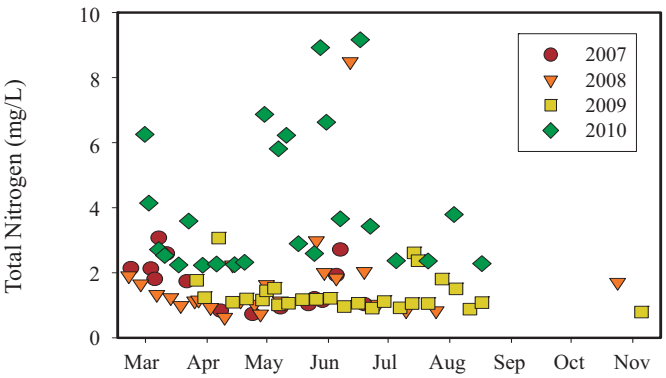
The precipitation normal that our research group has been comparing to is an average of 30 years of previous precipitation data collected at the Pincher Creek Environment Canada weather station and this value is 515 millimeters.

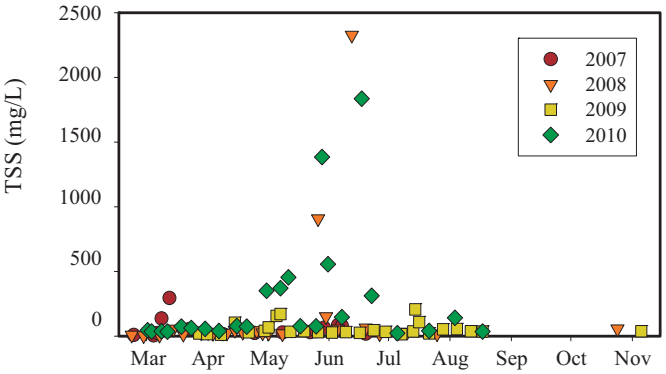
In the last four years, we have not seen anything "normal" in Indianfarm Creek (in terms of precipitation). The first year of the study was 2007 and this was a drier than normal year (339 mm), 2008 (644 mm) and 2009 (561 mm) were wetter than normal. In 2010, it is also shaping up to be a wetter than normal year (516 mm until August 31), but we shall see what happens this fall! About 54% of the precipitation fell as rain in May and June this year and this certainly had a huge effect on flows in the watershed. Talk about needing a life jacket and some rubber galoshes – Wowee!

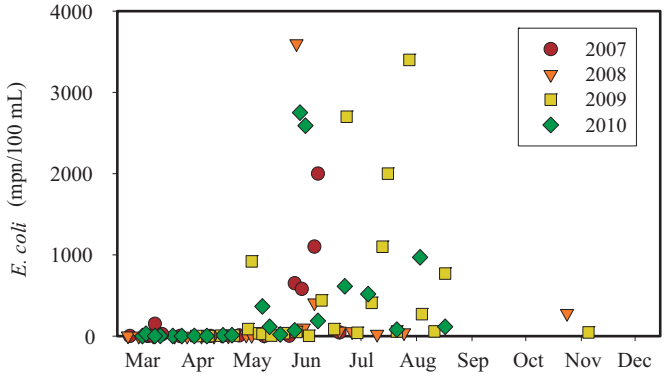

Flow metering on Indianfarm Creek – June 23, 2010











mg/L = milligrams per Liter
mpn/100mL = most probable number per 100 milliliters

"Flashy" Water Quality Peaks

The "flashy" rainfall events in the Indianfarm Creek Watershed sure kept our group busy, especially this last spring! Nitrogen and phosphorus parameter averages were higher in 2010 compared with previous years (based on data until the end of August 2010) and concentrations peaked simultaneously with the high flows in the creek and its tributaries. Total suspended solid concentrations were also higher in 2010 than in previous years and peaked in May and June. This trend was also observed in 2008, where, nitrogen, phosphorus, and total suspended solids (TSS) also peaked during the higher flows in late May and June. This was likely due to the greater than normal precipitation and saturated soil conditions that occurred prior to the high flow events in May and June in both years. Out of the 90 samples collected from the outlet in the last four years, approximately 86% and 94% of these samples have exceeded the Alberta Environment Protection of Aquatic Life total nitrogen and total phosphorus guidelines, respectively. *Escherichia coli* peaks generally occurred in the late spring and summer months in all four years (not in the summer of 2007, as the creek stopped flowing in late June that year), and this is likely due to a combination of livestock and wildlife impacts.

And the Creek Runs On

Last year, we thought it was pretty amazing there was flow into late August. This was the first year we have seen Indianfarm Creek run continually into the month of September. It seems to be shaping up to be a wet fall as well. And of course we will be out sampling the creek and its tributaries when the Therriault Dam water is released. If you see us out and about, please feel free to say hello and ask us about the study!

Many thanks to the participating producers for your interest and cooperation. Also, thanks to the project partners for the technical and financial support, including:

ACIDF Alberta Crop Industry Development Fund Inc.

Government of Alberta

Agriculture and Agri-Food Canada / Agriculture et Agroalimentaire Canada

Alberta Conservation Association

M.D. of Pincher Creek

Reed Canary Grass: A Benefit or a Risk?

Reed canary grass can be found growing along the stream banks of Indianfarm Creek. Area residents value the grass for bank stabilization and forage production, and it is still being planted today. However, this superior competitor may be of concern because of the risk it imposes on riparian ecosystems.

Is Reed Canary Grass Good for Forage?

Conservation agencies used to promote planting reed canary grass.The grass can be used in forage mixtures for crop rotations and as pure stands for pasture. Historically, the grass gained a reputation for lack of palatability and poor animal performance, due primarily to the alkaloid content. However, new recommended reed canary grass varieties are free of the alkaloids. Hence, properly managed, the grass has the potential to be an excellent cool-season grass species for hay and pasture with reasonable quality and palatability.

Nonetheless, conservation agencies are beginning to reconsider recommending reed canary grass because it may do more harm than good for the environment.

A Winner, But A Weed Nonetheless

Reed canary grass was deliberately planted as early as the 1800s in many riparian areas in North America. It is usually planted as forage for livestock or for protection of bank erosion, but the grass has also been planted as an ornamental and is known as ribbon grass. It is probably native to some regions of North America, but cultivars from Eurasia have been subsequently introduced and these cultivars are generally tougher or more invasive.

Once established in riparian areas, reed canary grass becomes invasive, replacing native vegetation including willows, and other shrubs or herbaceous species. Unlike native plants, the grass easily establishes and dominates disturbed areas, including eroded river banks. Characteristics that make the grass competitive include its ability to survive in a wide range of environmental conditions, like poor soils and areas prone to flooding. Vigorous reproduction by both seed and suckers ensures long-term productive establishment.

A monoculture of the grass will have numerous ecological consequences, ultimately reducing the variety of wildlife in riparian areas. Its growth is so rapid and prolific, and its environmental tolerances so broad, that it is capable of fully clogging stream channels, filling shallow ponds and lakes, and this can degrade fish and wildlife habitat. For these reasons, although reed canary grass is a good forage alternative, it is no longer recommended for planting in riparian areas.

Reed canary grass grows along Indianfarm Creek. While it provides bank stabilization and forage for cattle, it is an invasive species that suppresses native vegetation and ecosystem diversity.

Can Reed Canary Grass be Managed by Cattle?

Eradication of an established stand of reed canary grass is virtually impossible. Frequent cattle grazing may help control the spread of the grass, but it will not prevent its growth. Other forms of mechanical control, including burning, mowing and digging can also offer some control. However, seeds are fire resistant and the grass often has large seed banks, which allows subsequent regeneration. Herbicide control is often used to help control reed canary grass.

What Other Options are There for Bank Erosion?

Controlling bank erosion in Indianfarm Creek is a challenge. Bank erosion is a natural process of all streams, but the degree of erosion varies based on stream characteristics. Erosion is a dominant process in foothills streams that have "flashy" flows and overgrazed riparian areas can exacerbate the erosion.

An alternative to planting reed canary grass for erosion control is bioengineering, which is a process that uses native vegetation and mechanical bank stabilization engineering. Minimizing the impact of cattle activity is also important through the development of rotational grazing plans.

Excessive cattle grazing can exacerbate natural bank erosion, making it difficult for native vegetation to establish.

Reed Canary Grass Characteristics

Latin name: *Phalaris arundinacea*

Location of growth: Generally confined to riparian areas but can be grown on the uplands too

Height: up to 2.5 m (2 to 9 ft)

Colour: Blades are blue-green when fresh and yellowish in the fall

Flowers: Single pinkish flower clusters May to mid-June

Reproduction: Seed and creeping rhizomes

Water requirement: Drought tolerant, but can grow in water