



It Never Rains but it Pours:
Adapting to Climate Change with Rain
Gardens and Water Conservation

**Il ne pleut jamais, mais il
pleut à verse:**
Adaptation au changement climatique
avec des jardins pluviaux et de la
conservation de l'eau

October 2014 / octobre 2014

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EOS Eco-Energy 
Éco-énergie 


New **Brunswick** Nouveau
Your Environmental Trust Fund at Work
Votre Fonds en fiducie pour l'Environnement au travail

It Never Rains but it Pours ~ Il ne pleut jamais, mais il pleut à verse

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Executive Summary

Scientists forecast that New Brunswick will see an increase in average annual precipitation because of climate change. However, the increased precipitation will fall in fewer, more intense events with longer dry periods – “it never rains but it pours”. Adaptation to our changing precipitation patterns includes planting rain gardens to address storm water management and installing rain barrels to help conserve water for dry spells.

EOS Eco-Energy Inc., a non-profit environmental organization that serves the Tantramar region of South East New Brunswick with research, action and education on climate change and energy issues, was awarded funding from the New Brunswick Environmental Trust Fund to plant six rain gardens across Tantramar and conduct a water conservation campaign.

Rain gardens are shallow depressions (6 – 8 inches deep) containing native deep-rooted water loving grasses and plants. The depression allows rainwater to flow in and be held until it seeps naturally into the soil. Rain gardens do not hold rainwater long enough to become a breeding ground for mosquitoes.

Our methodology for the project included background research and a literature review as well as selection of the garden sites, sourcing plants, planting the rain gardens and monitoring them. The second part of the project involved raising public awareness of both the gardens and water conservation.

Garden sites were selected with the help of local municipal staff and/or councillors in Port Elgin, Dorchester and Memramcook, New Brunswick. After site selection the gardens were ready to be dug. Volunteers aided with all six gardens and included community members in each village, village staff and councillors, Ducks Unlimited Canada staff, PEDVAC staff, members of IODE, EOS staff and board members. There were seven volunteers during the planting of the Port Elgin gardens, six for Dorchester and eight in Memramcook. Port Elgin gardens are located at the village park on Shemogue Road and PEDVAC. Dorchester gardens can be found at Dorchester Consolidated School and St. Ed’s Community Hall. Finally, Memramcook gardens are located uphill from two baseball fields at College Bridge and Près-d’en-Haut. The six gardens range in size from roughly 75 square feet to over 85 square feet and contain between 65 and 70 native plants. They collect rain water off roofs, compacted lawns and/or paved roads and are helping to manage storm water runoff and localized flooding.

Raising awareness of rain gardens, water conservation and adapting to climate changes involved media coverage, using social media, attending community events, creating lesson plans for rain gardens to be used by Dorchester Consolidated School, and hosting a rain barrel workshop. In particular the EOS rain garden story was featured on CBC Radio, CBC.ca, Radio-Canada, News 91.9FM, Global TV News, and in the Sackville Tribune-Post, the Moncton Times and Transcript, Memramcook’s Le

Lien and the Dorchester Village Newsletter among other media. Brochures and guides were developed on the rain gardens and water conservation, including the benefits of rain barrels and how to maintain them. These documents were handed out during community events such as the Port Elgin Lupin Quilt and Craft Fair, Dorchester Sandpiper Festival, a rain garden tour in Memramcook, and the Sackville Fall Fair.

During these events rain garden plants and rain barrels were given out as prizes. Three more gardens were planted by prize winners for a total of nine rain gardens planted over the course of the project. An article about water conservation also appeared in local media. Finally EOS organized a water conservation workshop on how to make your own rain barrel. It was very popular, exceeding expectations with 5 people on the waiting list. Twenty people participated (the maximum allowed in the venue) and 17 barrels were taken home to be completed. One hundred percent of participants rated the workshop as 4/5 or 5/5 in evaluations.

In conclusion, municipalities and local residents across the Tantramar region were (and continue to be) very happy to partner with and learn from EOS in making their communities more sustainable and better adapted to climate change. Rain gardens and rain barrels are making a tangible improvement across the region.

Résumé

D'après les prévisions des scientifiques, le Nouveau-Brunswick connaîtra une hausse des précipitations moyennes en raison du changement climatique. Cependant, les précipitations accrues se dérouleront lors d'événements moins nombreux, mais plus intenses avec des périodes de sécheresse plus longues – « il ne pleut jamais, il tombe des trombes d'eau. » L'adaptation à nos modèles de précipitation modifiés comprend des jardins pluviaux pour composer avec la gestion d'eaux d'orage et l'installation de barils de pluie pour aider à conserver l'eau que l'on utiliserait durant les périodes de sécheresse.

EOS Éco-énergie Inc. (EOS) est un organisme environnemental sans but lucratif qui évolue dans la région de Tantramar du sud-est du Nouveau-Brunswick. Offrant des services dans les domaines de la recherche, de l'action et de l'éducation sur les questions de changement climatique et d'énergie, EOS Éco-énergie a obtenu des de l'argent du Fonds en fiducie pour l'environnement du Nouveau-Brunswick en vue de planter six jardins pluviaux à l'échelle de Tantramar et de réaliser une campagne sur la conservation de l'eau.

Les jardins pluviaux sont des dépressions peu profondes (6 po à 8 po ou 15 cm à 20 cm) qui abritent des herbes et des plantes à racines profondes qui aiment l'eau. Les dépressions permettent à l'eau de pluie de s'accumuler et de s'infiltrer naturellement dans le sol. Étant donné que les jardins pluviaux ne retiennent de l'eau que pour une courte période, ils ne sont pas des endroits de reproduction des moustiques.

La méthodologie du projet a compris de la recherche générale et un examen des écrits, ainsi que la sélection de sites de jardins, le choix de plantes, et la préparation et la surveillance des jardins pluviaux. La deuxième partie du projet consista à sensibiliser davantage les gens aux jardins et à la conservation de l'eau.

Les sites de jardins ont été sélectionnés avec l'aide du personnel ou des conseillers municipaux de Port Elgin, de Dorchester et de Memramcook, au Nouveau-Brunswick. Après avoir choisi les sites des jardins, nous avons commencé à creuser. Des bénévoles nous ont aidés à préparer six jardins. Ils étaient constitués de membres de la communauté, du personnel et des conseillers de chaque village, d'employés de Canards Illimités Canada, du personnel de PEDVAC, de membres d'IODE, et du personnel et du conseil d'administration d'EOS. Sept bénévoles ont travaillé à planter les jardins de Port Elgin; ils étaient six à Dorchester et huit à Memramcook. Les jardins de Port Elgin sont situés dans le parc du village sur le chemin Shemogue et à PEDVAC. Les jardins de Dorchester se trouvent à la Dorchester Consolidated School et au St. Ed's Community Hall. Finalement, les jardins de Memramcook sont situés en haut d'une colline, près de deux terrains de baseball à College Bridge et Près-d'en-Haut. Les jardins ont une taille qui varie d'environ 75 pi² (6,9 m²) à 85 pi² (7,8 m²) et contiennent de 65 à 70 plantes

indigènes. Ils recueillent de l'eau de pluie provenant des toits, des pelouses compactées ou des routes pavées, et aident à gérer les eaux d'orage et les inondations localisées.

Les efforts de sensibilisation aux jardins pluviaux, à la conservation de l'eau et à l'adaptation au changement climatique ont inclus une couverture médiatique, l'usage de médias sociaux, la participation à des activités communautaires, la création de plans de leçons sur les jardins pluviaux que l'on utiliserait à la Dorchester Consolidated School et la tenue d'un atelier sur les barils de pluie. En particulier, l'histoire des jardins pluviaux d'EOS a été présentée à la radio de CBC Radio, à CBC.ca, à Radio-Canada, à News 91.9FM, à Global TV News, dans le *Sackville Tribune-Post*, le *Times and Transcript* de Moncton, *Le Lien* de Memramcook et le bulletin du village de Dorchester, parmi d'autres médias. Des dépliants et des guides ont été créés sur les jardins pluviaux et la conservation de l'eau, y compris les avantages des barils de pluie et l'utilisation de ces derniers. Ils ont été distribués dans le cadre d'activités communautaires, notamment le marché et la foire de courtepintes Lupin, le Festival annuel des bécasseaux de Dorchester, une visite d'un jardin pluvial à Memramcook et la foire d'automne de Sackville. Pendant ces activités, des plants de jardins pluviaux et des barils de pluie ont été remis à titre de prix. Trois autres jardins ont été plantés par des gagnants de prix, ce qui signifie un total de neuf jardins pluviaux plantés tout au long du projet. Un article sur la conservation de l'eau a également paru dans un média local. Finalement, EOS a organisé un atelier sur la conservation de l'eau pour expliquer comment créer un baril de pluie soi-même. Il a été très populaire et cinq personnes ont été placées sur une liste d'attente, ce qui a dépassé nos attentes. Au total, 20 personnes ont participé (le maximum permis pour l'endroit de la tenue de l'atelier) et rapporté 17 barils qu'elles finiraient à la maison. Les participants étaient unanimes quant à leur satisfaction de l'atelier, comme en ont témoigné les évaluations de 4 sur 5 ou de 5 sur 5.

En conclusion, les municipalités et les résidents locaux de la région de Tantramar ont été très heureux de s'associer avec EOS (et continuent à être satisfaits de cette association) et d'apprendre comment faire de leur communauté un endroit plus durable et mieux adapté aux changements climatiques. Les jardins pluviaux et les barils de pluie constituent une amélioration tangible à l'échelle de la région.

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Introduction: Changing Precipitation Patterns

Scientists forecast that New Brunswick will see an increase in average annual precipitation because of climate change. However, the increased precipitation will fall in fewer, more intense events with longer dry periods – “it never rains but it pours”. Adaptation to our changing precipitation patterns includes planting rain gardens to address storm water management and installing rain barrels to help conserve water for dry spells. Rain gardens are depressions planted with native flowers and grasses that capture rainwater and let it absorb naturally into the ground rather than overflowing storm drains and leading to flooding.

This project builds on the success of the Regional Centre of Excellence on Education for Sustainable Development (RCE) Tantramar’s pilot project during the summer of 2013. The three rain gardens planted in Sackville last summer had a positive impact on managing and reducing storm water runoff. All three gardens survived the winter and are flourishing this year, having grown and filled in well and continue to collect rainwater and attract bees and butterflies.

EOS Eco-Energy Inc., a non-profit environmental organization that serves the Tantramar region of South East New Brunswick with research, action and education on climate change and energy issues, was awarded funding from the New Brunswick Environmental Trust Fund to plant six rain gardens across Tantramar and conduct a water conservation campaign. The six gardens include two in each of Port Elgin, Dorchester and Memramcook, New Brunswick.

This final report explains what a rain garden is and how it works, as well as the methodology used during the project. It also describes the six rain gardens planted, how they function and benefits to the landscape. The report concludes with a summary of the rain garden public awareness activities and the water conservation campaign.

Project Goals

The overall goal of the project was to:

Raise awareness and build capacity among residents of Tantramar concerning climate change induced precipitation changes and how to adapt to them. The original objectives to reach this goal were amended slightly due to decreased project funding:

1. Plant six rain gardens (two in each community of Port Elgin, Dorchester and Memramcook).

2. Involve local volunteers in each community to help plant the gardens in order to build local capacity to management storm water run off.
3. Educate the public about climate change, rain gardens and water conservation through media coverage, garden tours and community events.
4. Assist local residents in their adaptation efforts by having draws for free rain garden plants and freerain barrels.
5. Offer a make-your-own rain barrel workshop.

Literature Review

What is a Rain Garden?

As in the previous study done in 2013 by RCE – Tantramar there is still limited information available on rain gardens in the Maritimes and particularly in New Brunswick. However, an effective strategy for implementing rain gardens in the Tantramar area has been developed from the pilot project. The final report from the RCE Tantramar (Marlin, 2013) was referenced during this project for advice on planting, public education and general understanding of the project. Many how-to-guides were reviewed along with additional websites for information to further incorporate how beneficial rain gardens are in limited storm runoff and local adaptation to climate change.

Rain gardens are shallow depressions (15-20 cm deep) containing native deep-rooted water loving grasses and plants. The depression, similar to a bowl shape, allows for water to flow in and be held until it seeps into the soil. Rain gardens do not hold rainwater long enough to become a breeding ground for mosquitoes. They are more efficient when locations are chosen down hill from impermeable surfaces with a minimum of 3 m (10 ft) from building foundations (Marlin, 2013).



Source: www.nature.org

The Benefits of Rain Gardens: Reducing the impacts of Floods

Climate change is predicting an increase in storm intensities and frequencies allowing for greater flooding threats. Placement of rain gardens allow for some water to be taken away from the storm drains therefore one of the main benefits is to limit localized flooding during heavy participation events. Rain gardens also filter storm water runoff before reaching the ground water or a river system. Rain gardens have the ability to recharge the ground water. While doing so they beautify properties and provide habitat for insects, butterflies and other species (Marlin, 2013).

Storm water runoff becomes a larger issue when there is an increase in impermeable surfaces. Impermeable or hard surfaces allow for more water to be sent to the storm drains and sewage systems. In British Columbia 10% impermeable surfaces within a watershed or drainage area is considered a critical threshold. In some parts of Sackville, NB the land is covered by 19% impermeable surfaces leading to localize flooding events (J. Borneman, Regional Service Commission 7; Marlin 2013). However, when rain gardens are properly designed they can reduce runoff volumes by up to approximately 90 percent (Barr Engineering Company, 2006). Rain gardens can absorb 30-40% more rain than an average lawn (Marlin, 2013).

Growing Popularity of Rain Gardens

Rain gardens are very popular in the United States of America and, according to our research, are found in five Canadian provinces including: Ontario, British Columbia, Alberta, Quebec and Nova Scotia. The Regional Center of Expertise on Education for Sustainable Development (RCE) – Tantramar appears to be the first organization in New Brunswick to conduct a rain garden project. As mentioned above, during 2013 they carried out a successful rain garden pilot project as a sustainable and natural way to manage storm water runoff and as a step to locally adapt to climate change. For a virtual tour of many of Canada's rain gardens go to www.raingardentour.ca.

Methodology

Our methodology for the project included the background research and literature review described above as well as selection of the garden sites, sourcing plants, planting the rain gardens and monitoring them. The second part of our project involved raising public awareness of both the gardens and water conservation. These step are described below.

Garden Site Selection

In early spring, after preliminary background research and a literature review was completed, EOS staff toured Port Elgin, Dorchester and Memramcook with local

village staff and/or council members looking for suitable locations for the rain gardens. A suitable location would be downhill from an impermeable surface such as a street or parking lot, or near a downspout from a house or building. In addition, the location would be ideal if it was located between the source of increased rain water and a storm drain.

In addition, rain gardens cannot be placed on a slope greater than 12%. If the garden is placed on a steep slope and a berm isn't present then one should be constructed along the lower side of the garden to hold the water and create a more effective rain garden. Rain gardens need to be placed a minimum of 10 feet (3 meters) from any infrastructure to avoid damaging foundations. They should be planted in a sunny location and not under tree canopy or over a septic system. Rain gardens do not hold water for more than a day or so. They are not wetlands or ponds, but contain highly adaptable plants well suited to our climate that can withstand both wet and dry conditions and they help to take up a lot of water.

Six suitable locations were found and are explained in more detail below.

Plant Sourcing

Many of the plants used in the RCE-Tantramar pilot project during the summer of 2013 are best adapted to the New Brunswick climate and were purchased again for this project. The plants used were purchased from Corn Hill Nursery (Corn Hill, NB), MacArthur's Nursery (Moncton, NB) and Anderson's Greenhouse (Sackville, NB). For all six gardens the following plants were planted:

- Swamp Milk Weed
- Aster Purple Dome
- Joe Pye Weed
- Black-eyed Susan
- Blood Root
- Sweet Grass
- Common Rush
- Ostrich Fern
- Sensitive Fern
- Cinnamon Fern
- Beaked Sedge

For the gardens in Dorchester and Memramcook some additional plants were planted:

- White Turtle Head
- Marsh Marigold
- Blue Flag Iris
- Bee Balm



Rain garden plants waiting to be planted.

Planting and Monitoring the Gardens

After site selection the gardens were ready to be dug. Volunteers aided with all six gardens and included community members in each village, village staff and councilors, Ducks Unlimited Canada staff, PEDVAC staff, members of IODE, EOS staff and board members. There were seven volunteers during the planting of the Port Elgin gardens, six for Dorchester and eight in Memramcook.

Before digging took place NB Power was called to ensure that there were no underground wires around the garden sites. After removing the sod, the gardens were dug down about 20cm deep. They were leveled as much as possible to ensure that water would not pool in only one area and for proper design. Approximately two inches of compost was added to amend the soil (sand can be added to increase the permeability of clay soils too) and another 5 cm of mulch placed on top. The plants were then planted approximately 20 to 30cm apart. The compost and mulch were purchased from Audubon Organics (Moncton, NB) for Port Elgin and Dorchester. The village of Memramcook donated compost and mulch for their gardens. The municipality mulches resident's Christmas trees and obtains compost from the Moncton Sewerage Commission.

Raising Awareness

EOS used a variety of mediums and techniques to raise awareness about climate change, precipitation patterns, rain gardens and water conservation. How-To Guides on planting rain gardens were designed (Appendix 1) as was a pamphlet about water conservation and rain barrels (Appendix 2). These were distributed at a number of community events during the spring, summer and fall. A number of media interviews were conducted and articles appeared in local newspapers as well as stories on the radio and television (Appendices 3 and 4). A make-your-own rain barrel workshop was also held (Appendix 5). For the results of these initiatives, please see the section below on public awareness and the water conservation campaign.

The Tantramar Rain Gardens

Two rain gardens were planted in each of Port Elgin, Dorchester and Memramcook and are helping to alleviate drainage and localized flooding issues. All three municipal offices were very happy to partner with EOS on this project, as well volunteers. By working with over 20 village staff, councilors and volunteers in the three communities, capacity was increased locally to manage storm water runoff sustainably.

Village Park, Port Elgin, NB

The first garden in Port Elgin was placed in one of Port Elgin's public parks on Shemogue Road. This 7.4 sq m (80 sq ft) kidney bean-shaped garden (with 70 plants) was designed mainly to improve the area for natural drainage function and for public awareness. There aren't any storm drains within the park boundaries but rain gardens have the ability to adsorb 30 to 40 percent more water than lawns therefore placing a garden here will allow for the area to remain drier during rain events. Climate change is predicted to increase rainfall events therefore by placing a rain garden within the area, will allow for the area to become better adapted by simply having an area of additional absorption. The garden is also located next to Gaspereaux River and will filter rain water and runoff through the bio-filtration capacity of the plants and soil before reaching the river, thereby contributing to increased river health.



Before and after pictures of the Port Elgin Park location

Pedvac, Port Elgin, NB

The second rain garden in Port Elgin was placed outside Pedvac (a volunteer community centre, food bank, etc) at 12 Church Street near a natural slope. This 7.4 sq m (80 sq ft) kidney bean-shaped garden (with 70 plants) was designed to catch water runoff from the street and divert the water from the storm drains further up the road. This garden was placed along a popular road, which has good visibility to allow the public to see and understand the functions of a rain garden better.



Before and after pictures of the PEDVAC garden site

Dorchester Consolidated School, Dorchester NB

The first garden in Dorchester was planted behind Dorchester Consolidated School. The 6.5 sq m (70 sq ft) oval-shaped garden (with 60 plants) was placed above a location where pooling or rainwater is found. This location previously held an old playground area and has a slow absorption rate. By placing the garden here we are hoping to reduce the drainage problems found further down hill and for the garden to be used as an educational tool for school students. Rain gardens can be an example for the water cycle and climate change education and adaptation (Appendix 6). The school is also used for a number of community events allowing for a much higher number of people to be aware of the rain gardens in their community. During the planting of this garden staff and volunteers were interviewed for a Global TV News story (Appendix 4).



Before and after pictures of the Dorchester School location

St. Ed's Community Hall, Dorchester, NB

The second rain garden was placed on village property at 4955 Main Street next to the community building, St. Ed's Hall. As the first location in Dorchester it is also located in an area where local people are more likely to notice it and know what rain gardens are doing for their community. This location was chosen because it is an ideal location with a slight slope up-hill from a storm drain. The garden captures rain from the parking lot above, the surrounding lawn and large roof of the hall. This 7 sq m (75 sq ft) teardrop-shaped garden (with roughly 65 plants) helps to minimize the contribution of water runoff into the storm drain.



Before and after pictures of St. Ed's Hall gardens in Dorchester

College Bridge Baseball Field, Memramcook, NB

There were many locations to choose from for Memramcook, however for maximum impact two baseball fields were chosen which experience drainage issues as they are both at the bottom of hills and receive a lot of runoff. The village of Memramcook had recently renovated one field and this would be an added bonus to help protect the fields. For the first location, College Bridge Baseball Field, the rain garden was placed up-hill from two storm drains to help adsorb runoff from the lawn above and protect the baseball field below. The garden was kidney bean-shaped and measured about 7.4 sq m (80 sq ft) with 70 plants.



Before and after pictures of College Bridge Garden, Memramcook

Près d'en Haut Baseball Field, Memramcook, NB

For the second baseball field, Près d'en Haut, the rain garden was again chosen to better protect the field from small flooding events. The exact placement was chosen just above a ditch near the fencing of the field. The ditch is already home to different species of grasses and sedges and can be found to hold water for long periods of time. The rain garden was placed about 1.5 m above the ditch to catch rainfall from the slope above before it has a chance to enter the ditch and baseball field. It was roughly 8 sq m (85 square ft) and was planted with 70 plants.



Before and after pictures of the Près d'en Haut Baseball Field rain garden

Monitoring the Gardens

Rain gardens mimic natural habitats and because of this require little maintenance once they are established (Marlin, 2013:11). For the first year it is important to weed the gardens and water them until they are growing on their own. In Port Elgin the gardens were watered and monitored by the village and PEDVAC staff throughout the summer. In Memramcook village staff watered and monitored their gardens. Dorchester staff monitored and watered the garden at St. E's Hall while EOS staff and community volunteers watered and kept an eye on the Dorchester Consolidated School garden.



St. Ed's Hall, Dorchester rain garden catching rain off the roof

EOS staff also monitored the three Sackville, NB gardens planted during summer 2013 by RCE-Tantramar. All three gardens grew considerably and filled in a lot with plants having spread and multiplied. All species of plants survived the especially cold and snowy winter and the gardens continue to function as designed, collecting rain water off roofs, roads, compacted lawns and paved areas.



One year old rain garden in Sackville, NB originally planted by RCE-Tantramar in 2013

Water Conservation Campaign and Rain Garden Awareness

Raising awareness of rain gardens, water conservation and adapting to climate changes involved media coverage, using social media, attending community events, and hosting a rain barrel workshop.

Media Coverage

People were made aware of the project through social media including: EOS's Facebook page, Twitter and website (in both English and French). Notices were placed in Le Lien (Memramcook community newsletter) and the Dorchester Newsletter. Multiple radio stations including CBC Radio, Radio Canada, 91.9 FM The Bend, in Moncton and Mount Allison University's CHMA radio did stories on the project along with Global TV (Appendix 4). The Sackville Rotary club also invited EOS's Executive Director, Amanda Marlin, to present on the project to club members. Articles were placed in local newspapers such as the Sackville Tribune and the Moncton Times and Transcript (Appendix 3).



CBC.ca story on the rain gardens planted in Port Elgin, NB

Community Events

In addition to interviews and media coverage during the duration of the project, EOS attending or hosted community events in all four municipalities in Tantramar. EOS staff spoke to well over 400 people during the course of the summer. EOS provided rain garden tours and helped to increase participants' capacity to deal with climate change, flooding and conserving water. During the community events EOS held draws for rain garden plants and rain barrels. The rain barrels were donated to EOS by Eco-Container Co. of Dorchester, NB. Pamphlets were prepared on rain barrels and water conservation in English and French (Appendix 2). They were available at local events attended throughout the duration of this project including all rain garden awareness events and given to winners of the four rain barrels.

Port Elgin Lupin Quilt and Craft Fair

In Port Elgin EOS had a display table with information about rain gardens and water conservation at the annual Lupin Fair on July 5th in the Port Elgin School. Because of Hurricane Arthur raging outside on July 5th, only a "virtual" tour of the Port Elgin rain gardens was feasible. A video screen at the EOS booth displayed pictures of the planting process and the finished gardens. Six rain garden plants and a rain barrel were given away to two lucky winners. More than 50 people entered the draws.



EOS staff talking to local residents at the Port Elgin Lupin Quilt and Craft Festival

Dorchester Sandpiper Festival

EOS also participated in the Dorchester Sandpiper Festival held July 26th by hosting a booth in the Village Square (festival headquarters). The EOS booth featured a “Kids’ Climate Corner” with books and colouring sheets on water conservation, climate change, and gardening. It was a very popular spot on a hot sunny day! EOS also gave away 12 rain garden plants and one rain barrel to two lucky (and excited!) winners. EOS staff spoke to over 60 people at the Festival about rain gardens, rain barrels and the work that EOS does in the region. EOS staff also ran garden tours of the local Dorchester rain gardens with information on what rain gardens are, how they work, why they are important and more.



Kids’ Climate Corner at the EOS booth during the Dorchester Sandpiper Festival



EOS booth during the Sandpiper festival in Dorchester. ETF staff person Prativa Pradhan joined EOS for the day to help hand out information on climate change.

Memracook Rain Garden Tour

A rain garden tour and the chance to win rain garden plants and a rain barrel was advertised locally in Memramcook for the evening of July 22nd at the College Bridge Baseball Field. Roughly 20 people were in attendance during a baseball game. EOS board member and Memramcook Village councilor Don LeBlanc was on hand to congratulate the winners of the rain garden plants and rain barrel, shown below.



Winners of the rain barrel and plants in Memramcook. From left to right EOS board member and Memramcook Village councilor Don LeBlanc with winners Lyne Melanson and Eric Reid

Sackville Fall Fair

EOS concluded the rain garden and water conservation project with a booth at the Sackville Fall Fair on September 20th. The popular annual event sees over 6000 people descend on Sackville for a parade, Farm Day, carnival rides, concerts and more. EOS's booth was at the Field Day on the property of a local farm. The EOS booth had a chance to win a large double barrel rain collection system (pictured below). Over 50 people entered the draw and it was won by Quinn MacAskill of Sackville. EOS also had information about climate change, rain gardens and water conservation on hand.



A rain barrel water collection system was given out to a lucky winner at the Sackville Fall Fair

After the summer community events were over and sets of free plants were given out, three additional rain gardens were planted by the winners. This means that a total of nine rain gardens were planted this summer across Tantramar, in addition to the three planted last summer by the RCE-Tantramar. Three rain barrels plus a double barrel system were given away as part of our water conservation campaign meaning more water is being conserved across Tantramar. Further rain barrels were installed as a result of our rain barrel workshop as well (details below).

Make-Your-Own Rain Barrel Workshop

EOS hosted a make-your-own rain barrel workshop on Saturday, August 16th in the Sackville Community Garden. Twenty people attended and increased their capacity to conserve water. Seventeen barrels were taken home to be turned into customized rain barrels.

The workshop began with a brief overview by EOS staff of how climate change scientists predict that precipitation patterns will change. It is forecasted that there will be more precipitation overall in Tantramar but that it will fall less often and in more intense storms and down pours followed by longer drought periods. One way to adapt is with rain barrels that collect rainwater and keep it for dry periods in order to wash cars, water gardens, etc. EOS staff then turned the floor over to Macx MacNichol of the Eco-Container Co. of Dorchester.



The poster for the 'Make your own Rain Barrel Workshop' features the EOS Eco-Energy Inc. logo at the top. It includes three photographs: one showing various colored plastic barrels, another showing two finished rain barrels with decorative paint, and a third showing a plain white barrel with the text 'Only \$10 and includes a plain barrel like this one!'. The event details are listed on a green background: 'At the Sackville Community Garden (Charles St.) Sat., August 16, 2014 2-5pm Free childcare \$10 (includes a barrel!)'. Contact information for EOS is provided: 'Contact EOS to register by August 14th, 2014. Spaces are limited. 526-4407 or eos@eosinc.com. If price is a barrier, something available.' It also notes 'Bring your own lawn chair' and 'Rain date: Sunday, Aug. 17th 2-5pm'. Logos for 'In partnership with: Eco-Container Co.', 'The Sackville Community Garden', 'Tantramar Family Resource Centre', and 'New Brunswick' are at the bottom.

Macx explained that water bills may increase in the future, not because of a shortage of water in our area but because of increasing maintenance costs on municipal treatment systems. So a rain barrel is a great investment!

Participants learned about different designs for rain barrels and how to connect them to their downspouts and eaves. In addition they learned how to create a filter out of old pantyhose and rubber bands. Filters keep bugs, twigs and dirt, etc. out of the rain barrels. The benefits of soaker hoses, such as direct watering and no wasted water, were explained. It was suggested to connect a second barrel (to catch the overflow from the first) via an underground hose or pipe. A lot of water comes off the average sized roof and one barrel may not be enough. A second barrel can be hidden away from the house in a useful location and connected by an underground hose or pipe. It is also important to control the overflow of water once the main barrel is full. You do not want water to collect and pool by the house, or by your foundation.



Participants learned how to make their own rain barrel at EOS's DIY Rain Barrel Workshop

There are various rain barrel systems to choose from. The simplest is to cut the top off a plastic food-grade barrel. Another step is to attach a spigot and valve (tap) near the bottom so that a hose can be attached. Finally, you can choose to have a closed lid or a screw lid (with a small hole for a downspout), which keeps the barrel free from debris. As the winter approaches it is also a good idea to drain, disconnect and put away rain barrels so that frozen water left in them does not split the barrels.

Macx listed two scrap yards where the public can go and find a multitude of items that can be re-used and re-purposed into rain barrels and other items. He mentioned the Tri Province Scrap Yard and DNR Recycling, both in Moncton. Other uses for barrels include composters (with black food grade barrels), tomato planters, livestock water dishes or feed bins, or garbage cans.

At the end of the workshop participants each chose a barrel and had the chance to ask Macx specific questions about their design and their needs. There was also an optional tour of the Sackville Community Garden provided by the garden coordinator, Norma Jean Worden-Rogers. During the workshop free childcare was provided by the Tantramar Family Resource Centre in a separate but nearby area of the garden. The event was a true partnership between local community groups and proved very successful. There were 5 people on the waiting list to attend if spaces freed up!

Evaluation forms were handed out to participants at the end of the workshop. One hundred percent of the workshop participants rated the workshop a 4/5 or 5/5 for content, venue, speakers, refreshments, date/time, price, and the overall workshop experience. Their written commitments to conserve water were inspiring. Some of the comments were:

"I would love to see more of this type of workshop being held."

"I appreciated the community skill-building and knowledge sharing aspect of this workshop. I also thought it was great to have a practical workshop to address/adapt to the impacts of climate change. "

"It was very informative 😊"

"This would be a great presentation for middle grades to high school. Thanks for offering this!"

"Amazing! Inspired."

"I can't wait to go home and install my rain barrel."

It is estimated that each rain barrel will save the average household 11,735 L (3,100 gal) of water a year (EPA, 2009). Between the rain barrel workshop and rain barrel prizes at community events 21 barrels were handed out for a total savings of 246,430 L (65,100 gal) of water annually now and into the future!

Conclusions and Recommendations

The rain garden project was a success for the Tantramar region; they began working after the very first rainfall. All the gardens worked continue to receive great feedback from the communities. They are a wonderful and beautiful way to locally adapt to climate change. The plants and rain barrels given away were accepted with smiles and happy winners. Overall the water conservation campaign was successful with 20 people in attendance at the rain barrel workshop. Municipalities and local residents across the Tantramar region were (and continue to be) very happy to partner with and learn from EOS in making their communities more sustainable and better adapted to climate change. Rain gardens and rain barrels are making a tangible improvement across the region. It is recommended to plant more rain gardens across Tantramar and further promote the use of rain barrels in the future.

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Appendices

Appendix One – How-to Guide on Rain Gardens in English and French

Adapting to Climate Change

Why and How to Plant Rain Gardens in Tantramar

What is a rain garden?

A rain garden is a shallow depression (4-8 inches deep) that is planted with deep-rooted native plants and grasses. It allows rainwater runoff from impervious areas like roofs, driveways, parking lots, and compacted lawn areas the opportunity to be taken up by water-tolerant plants and absorbed into the ground naturally instead of entering storm drains. A rain garden mimics the natural absorption and pollutant removal abilities of a forest or meadow. Rain gardens can absorb 30-40% more rain than a standard lawn! They capture and hold rain water for a short time, releasing it slowly into the soil.



How does it work?

Deep rooted native plants (that are naturally found at a wetland's edge) help to take up excess rain water in the rain garden and return water vapor to the atmosphere. Their deep roots also help to increase the permeability of the soil and sustain diverse microbial populations involved in biofiltration. Deep rooted native plants are also the best adapted to our climate and have the ability to find water deep in the ground during dry periods. Rainwater and pollutants filter through the soil layers before entering the groundwater system. Because water is held in the garden for only a short time before it is absorbed into the ground, rain gardens are not breeding grounds for mosquitoes.

Why build one?

Tantramar has experienced freshwater floods in the past and will see more intense storms more often due to climate change. Even small towns can have too many impermeable surfaces that increase storm water runoff and put pressure on storm drains. Building a rain garden in your own yard is one of the easiest and most cost efficient things you can do to

reduce your contribution to storm water runoff and adapt to climate changes. Storm water runoff can cause erosion, contribute to water pollution, localized flooding and even decrease groundwater levels. Rain gardens can also keep pollutants out of coastal waters and reduce coastal erosion.

How to make your own rain garden:

Rain gardens are easy and quick to build. They can be installed without permits or heavy equipment.

Choose a location

Place the garden at least 10 feet (3m) away from your home or building to prevent damage to your foundation (from the water that will collect there). Do not dig the garden over a septic field. Choose a location near your downspouts or driveway to capture rainwater. Try to choose a naturally occurring low spot in your yard and a location in the sun or part sun. Do not place your garden on a slope of more than 12%. If there is a slight slope, you can build a small berm (earth wall) on the lower side to help keep the water in place so it has the chance to absorb into the ground.

Measuring drainage area

If you are capturing water from a roof or other hard surface you should measure the specific drainage area of that surface and multiply by the number associated with the type of soil you have. For sandy soil multiply by 20%, for loam use 30-35% and for clay use 45-60%. However, any size rain garden is better than nothing and will improve the land.



Choose your plants

Native plants (flowers and grasses) are great for rain gardens because they are best adapted to our climate. Those naturally found near the edge of a wetland or in ditches can tolerate being wet and dry. Here are some suggested plants for rain gardens in Tantramar:

- Beaked Sedge
- Black-eyed Susan
- Blue Flag Iris
- Blue Vervain
- Blood Root (best in shadier spots under ferns)
- Cinnamon Fern
- Common Rush
- Joe Pye Weed
- Ostrich Fern (fiddleheads)
- Swamp Milkweed
- Sweet Grass

The above plants (native to the Maritimes) can be purchased from Anderson's Greenhouse (536-3094) or Corn Hill Nursery (506-756-3635). There are many other suitable native plants but they are harder to find commercially. Contact the nurseries to find out other suitable plants they may have. Many of the above plants will also attract butterflies and bees. It is best to use 1 year old plants (or older) in 1-2 gal size pots so that they are sturdy and established.

Design your garden



Knowing how big your garden should be and the flowers you can get for it, decide on your design. Organic shapes are pleasing to the eye and work well such as kidney beans, tear drops, and other curvy shapes. Clump species of plants together for a larger impact statement. As a guide, plant your

plants about 1 foot apart if using 1-2 gallon size plants (or no more than one plant per square foot).

Source: Information is adapted from A. Marlin (2013) Regional Centre of Expertise on Education for Sustainable Development – Tantramar.

Dig the garden and plant the flowers and grasses

****Before digging check with NB Power to make sure there are no underground wires!**** Then, remove the turf grass and dig your garden approximately about 8 inches deep. Use the soil to build a berm around the lower edges of the garden if necessary (if sloped). Make sure the berm material is stable and waterproof to allow water to be held in the garden. Amend the soil with 2-3 inches of compost. Plant your native plants according to your design using a hand trowel. Dig a hole, fill with water, plant a plant. Continue until your garden is planted. Then spread 2-3 inches of mulch around the plants to keep the soil damp and the weeds out.



Water and Maintenance

After you've planted the garden, water every other day for 2 weeks if it doesn't rain until your garden looks to be growing on its own. Good watering is vital to establish a rain garden. Weed the garden as needed but the mulch will help to keep weeds at bay. Eventually as the rain garden plants take over, little or no weeding or watering will be required. Rain gardens are designed to be low maintenance storm water management systems. Enjoy your garden and thank you for helping to manage storm water and adapt to climate change in Tantramar!

Contact for more information:



(506)536-4487
eos@nb.aibn.com
www.eosecoenergy.com

With funding from:



Adaptation aux changements climatiques

Pourquoi et comment planter des jardins pluviaux à Tantramar

Qu'est-ce qu'un jardin pluvial?

Un jardin pluvial est une dépression peu profonde (de 4 po à 8 po ou encore 10 cm à 20 cm) où l'on fait pousser des plantes et des herbes indigènes à racines profondes. Grâce aux jardins pluviaux, le ruissellement des eaux de pluie d'endroits imperméables comme les toits, les entrées de cour, les voies piétonnières, les stationnements et les endroits de pelouse compacte est absorbé par des plantes qui aiment l'eau et s'infiltrent dans la terre de façon naturelle plutôt que de se rendre dans les égouts pluviaux. Les jardins pluviaux reproduisent les capacités d'absorption naturelle et d'élimination des polluants d'une forêt ou d'un pré. Ils peuvent absorber jusqu'à 30 % à 40 % de plus d'eau de pluie qu'une pelouse standard! Par ailleurs, ils captent et retiennent l'eau de pluie pendant une courte période, la libérant lentement dans le sol.



Comment fonctionne un jardin pluvial?

Les plantes indigènes à racines profondes (qui se trouvent naturellement en bordure des milieux humides) aident à absorber l'eau de pluie dans les jardins pluviaux et libèrent la vapeur d'eau dans l'atmosphère. Leurs racines profondes aident aussi à améliorer la perméabilité du sol et assurent la subsistance des différentes populations microbiennes associées à la biofiltration. Par ailleurs, les plantes à racines profondes sont les mieux adaptées à notre climat et ont la capacité de trouver l'eau dans les endroits profonds du sol durant les périodes de sécheresse. L'eau de pluie et les polluants sont filtrés par les couches du sol avant de pénétrer dans le système souterrain. Étant donné que les jardins pluviaux ne retiennent de l'eau que pour une courte



période, ils ne sont pas des endroits de reproduction des moustiques.

Pourquoi planter un jardin pluvial?

Tantramar a connu des inondations d'eau fraîche par le passé et affrontera plus souvent d'autres tempêtes plus intenses en raison des changements climatiques. Même les plus petites villes ont de nombreuses surfaces imperméables qui augmentent le ruissellement d'eau de pluie et font pression sur les collecteurs d'eaux pluviales. Il est très facile et économique de planter un jardin pluvial dans votre propre cour et ainsi diminuer votre contribution au ruissellement d'eaux de pluie et vous adapter aux changements climatiques. Le ruissellement d'eaux de pluie peut entraîner une érosion, contribuer à la pollution de l'eau et aux inondations localisées, et même diminuer le niveau d'eaux souterraines. Pour leur part, les jardins pluviaux peuvent éloigner les polluants des eaux côtières et réduire l'érosion des côtes.

Comment faire pour planter votre propre jardin pluvial

Il est facile et rapide de construire un jardin pluvial. Vous n'avez pas besoin de permis ou d'équipement lourd.

Choisissez l'emplacement

Placez le jardin pluvial à au moins 10 pi (3 m) de votre maison ou d'un immeuble pour éviter d'endommager la fondation (en raison de l'eau qui s'y accumulerait). Ne l'aménagez pas sur un système de dispersion d'égouts. Choisissez un emplacement près de vos tuyaux de descente ou de votre entrée de cour pour capter l'eau de pluie. Essayez de choisir un endroit qui est naturellement plus bas dans votre cour et au plein soleil ou au soleil voilé. Ne placez pas votre jardin sur une pente de plus de 12 %. S'il y a une légère pente, vous pouvez construire une petite berme pour retenir l'eau jusqu'à ce que cette dernière pénètre dans le sol.

Mesurez l'endroit de drainage

Si vous captez l'eau d'un toit ou d'une autre surface dure, vous devriez mesurer l'endroit de drainage précis de cette surface et multiplier par le nombre associé avec le type de sol que vous avez. Pour des sols sablonneux, multipliez par 20 %; s'il s'agit d'un

terrain de glaise, multipliez par 30 % à 35 % et si le sol est argileux, multipliez par 45% à 60 %. Cependant, il vaut mieux avoir un jardin pluvial tout petit que de ne pas en avoir un du tout. Il vous permettra d'améliorer votre terrain.

Choisissez vos plantes

Des plantes indigènes (des fleurs et des herbes) sont parfaites pour les jardins pluviaux parce qu'elles s'adaptent le mieux à notre climat. Celles qui se trouvent naturellement près des bordures de milieux humides ou dans les fossés tolèrent bien l'humidité et la sécheresse. Voici quelques suggestions de plantes pour les jardins pluviaux à Tantramar :

- Carex rostrés
- Marguerites jaunes
- Iris versicolores
- Verveines hastées
- Sanguinaires du Canada (il vaut mieux les planter dans des endroits ombragés sous les fougères)
- Osmondes cannelles
- Joncs épars
- Eupatoires maculées
- Fougères-à-l'autruche (têtes de violon)
- Asclépiades incarnates
- Hierochloés odorantes



Vous pouvez vous procurer les plantes susmentionnées (indigènes des Maritimes) auprès d'Anderson's Greenhouse (536-3094) ou de Corn Hill Nursery (506-756-3635). Il existe de nombreuses autres plantes indigènes adéquates, mais elles sont plus difficiles à trouver dans les magasins. Communiquez avec les pépinières pour vous informer sur les autres plantes indigènes qu'elles pourraient vous offrir et qui pourraient convenir aux jardins pluviaux. Un grand nombre de ces plantes attireront les papillons et les abeilles. Il est préférable d'utiliser des plantes d'un an dans des pots de taille de 1 à 2 gallons pour qu'ils soient solides et établis.

Faites la conception de votre jardin

Une fois que vous avez déterminé la taille de l'endroit choisi et les fleurs que vous souhaitez y planter, penchez-vous sur la conception de votre jardin pluvial. Les formes organiques sont plaisantes sur le plan esthétique et donnent de bons résultats, par exemple les formes de haricots, de larmes et autres conceptions sinueuses. Placez des espèces de plantes ensemble pour faire plus grande impression. À titre de guide, placez vos plantes à environ 1 pi (0,3 m) les unes des autres si vous utilisez des plantes d'une

taille de 1 ou 2 gallons (on en compte pas plus d'une plante par pied carré).

Creusez le jardin et placez-y les fleurs et les herbes

****Avant de creuser, vérifiez auprès d'Énergie NB pour vous assurer qu'il n'y a pas de fils souterrains!****

Enlevez ensuite toute herbe à gazon et plantez votre jardin à environ 8 po (20 cm) de profondeur. Utilisez la terre pour construire une berme autour des bords inférieurs du jardin, si nécessaire (quand il y a une pente). Assurez-vous que le matériau de la berme est stable et imperméable pour que cette dernière puisse retenir l'eau dans le jardin. Ajoutez de 2 po à 3 po (5 cm à 7 cm) de compost à la terre. Au moyen d'une truelle à main, plantez vos fleurs et herbes en fonction de votre concept. Creusez un trou, remplissez-le d'eau et mettez-y une plante. Continuez jusqu'à ce que vous ayez terminé votre jardin. Étalez ensuite 2 po ou 3 po (5 cm à 7 cm) de paillis autour des plantes pour garder la terre humide et éviter que les mauvaises herbes y poussent.



Eau et entretien

Après avoir aménagé votre jardin, arrosez-le tous les deux jours pendant deux semaines s'il ne pleut pas jusqu'à ce que vous remarquiez que le jardin pousse par soi-même. Il est nécessaire d'arroser le jardin pluvial pour obtenir des résultats optimaux. Enlevez les mauvaises herbes lorsque vous en voyez, mais le paillis devrait vous aider à contrôler ce problème. Éventuellement, à mesure que votre jardin prend vie, il ne vous sera plus nécessaire de l'arroser ou d'enlever les mauvaises herbes. Les jardins pluviaux sont conçus pour être des systèmes de gestion d'eau pluviales nécessitant peu d'entretien. Nous espérons que vous aimerez votre jardin et nous vous remercions d'appuyer les efforts déployés pour gérer les eaux d'orage et s'adapter aux changements climatiques à Tantramar!

Projet rendu

possible grâce au :



Pour obtenir plus de renseignements :

(506)536-4487 ~ eos@nb.aibn.com
www.eosecoenergy.com/fr

Appendix Two – Water Conservation Pamphlets in English and French

Water Use Facts!

- Canadians are the second highest consumer of water world wide
- 11 litres (3 gallons) runs from the average tap per minute
- 151 litres (40 gallons) are used in a 10 minute shower
- A bath uses an average of 75 litres (20 gallons)

Canadians use 329 litres of water per person per day

- 95 litres (25 gallons) are used to flush a toilet per person per day
- Traditional (non-energy star) clothes washers use up to 189 litres (50 gallons) per load
- A dishwasher uses approximately 53 litres (14 gallons) per load
- An average hose uses 492 litres (130 gallons) every 15 minutes
- Washing your car can use 378 - 606 litres (100 - 160 gallons)

Source: http://www.ecoenergy.ca/edu/facts/107_Canadian%20Conservation/Water%20Use%20Handout.pdf

Rain Barrel Maintenance

- Store it inside during the winter or outside turned upside with the spout covered.
- Ensure the overflow tube is facing away from the foundation.
- Have a screen or store bought cover or screen to keep bugs, debris and mosquitoes out. A few drops of dish soap also aids with mosquitoes.
- For smelly stagnant water and algae build up; empty barrel and clean with 2 parts water and 1 part bleach.

Rain Barrel Safety

Conduct research before using a rain barrel to ensure the safety of the rain barrel, your home and vegetables!

- Vegetables should not be washed in rain water prior to consumption.
- Buy a food-grade barrel with the correct signage (on right) when used for food consumption
- Rain barrels should not be used with roofs containing asbestos.
- For chemical concerns do not use the first rain fall load and empty the barrel through the bottom.



Source: <http://www.rainbarrel.ca/edu/maintenance/>
<http://www.greenhousebury.ca/ing/greenhouse/bath-tub-2007-jardin-adding-bassin-barrel-a-concept-ya-nous-connait>
Source: <http://www.fishandgame.com/forums/104494-rain-barrel>

Why Conserve Water?

Water is one of the world's most precious resources. People use it daily for brushing their teeth and washing their cars. It is used in food and clothing production.

Less than 1% of the world's water is available for human use

Because of the limited amount of potable water and continuing increase in population it is important to not over use what resources we have. Water is currently being used at a faster rate than it can be replenished. Climate change predicts more intense storms and frequencies but also longer drought periods calling for the need to conserve water.

How Rain Barrels Conserve Water

A rain barrel collects rain water from the down spout off your roof. The water can be used for various tasks such as washing your car and watering your garden, even the vegetable garden! Saving countless amounts of fresh water for other uses.

The average savings from a rain barrel is 4900 litres (1300 gallons) of water a summer and water meter savings of \$200

Benefits of a Rain Barrel

- Reduced water bill and conserving fresh water for other uses
- Have aided in removing wet spots from basements and electric bill savings when a sump pump is installed
- The over flow tube can be directed to a rain garden to help recharge and filter ground water
- Rain water is better for plants and soil
- You'll have available water during times of drought and times of limited use
- Contributes to erosion prevention efforts and reduces pollution run off



Picture by Max MacIsaac

Source: <http://www.environmental.nsw.gov.au/2003/03/rainbarrels.html>
<http://www.rainbarrel.com/sustainable-product-design-2007.html>
<http://www.fishandgame.com/forums/104494-rain-barrel>
http://www.ecoenergy.ca/edu/facts/107_Canadian%20Conservation/Water%20Use%20Handout.pdf

Other Ways to Conserve Water

- Turn the tap off when brushing your teeth
- Take shorter showers
- Fix leaky faucets and hose nozzles
- Don't use the toilet as a waste basket
- Install low flow faucets and Energy star appliances
- Insulate water pipes
- Minimize use of disposal units

For information please contact
EOS Eco-Energy at 536 - 4487 or e-mail
EOS@rb.altn.com

For information on purchasing rain barrels please
contact Eco-Container Co. at (506) 370 - 2211;
(506) 370 - 0678 or e-mail macjack@rogers.com

Eco-Container Co.

This project is presented by
EOS Eco-Energy and funded by the New
Brunswick Environmental Trust Fund



Rain
Barrels
&
Water
Conservation



Picture: <http://www.rainbarrel.com/edu/water-conservation.htm> & Max MacIsaac

Entretien du baril de pluie

- Pendant l'hiver, entreposez le baril à l'intérieur ou à l'abri, à l'extérieur, et recouvrez le bec verseur.
- Assurez-vous que le tuyau de trop-plein se trouve du côté opposé de la fondation.
- Utilisez une grille ou un couvercle ou une grille d'un magasin pour éviter que les insectes, les débris et les moustiques entrent dans le baril. Quelques gouttes de savon à vaisselle peuvent également servir à repousser les moustiques.
- Dans le cas d'une eau stagnante odorante et d'une accumulation d'algues, videz le baril et nettoyez-le au moyen de deux portions d'eau et d'une portion d'eau de Javel.

Baril de pluie sécuritaire

Effectuez de la recherche avant d'utiliser un baril de pluie pour en assurer la sécurité et celle de votre maison et de vos légumes.

- Les légumes ne devraient pas être lavés dans l'eau de pluie avant qu'ils ne soient consommés.
- Achetez un baril de qualité alimentaire portant le bon affichage (image à droite) quand il est utilisé à des fins de consommation alimentaire.
- N'utilisez pas des barils de pluie quand il y a des toits contenant de l'amiante.
- Si vous vous souciez de produits chimiques, n'utilisez pas la première accumulation d'eau de pluie et videz le baril par le dessous.



Source: <http://www2.ec.gc.ca/info-fact/index-eng.html>
 Questions générales sur l'usage de produits chimiques dans les jardins
 2010/09/01 10:00 AM
 http://www2.ec.gc.ca/info-fact/index-eng.html

Faits au sujet de l'utilisation de l'eau

- Les Canadiens et Canadiennes se classent au deuxième rang pour ce qui est de la consommation d'eau dans le monde entier.
- En moyenne, 11 L (3 gallons) s'écoulent d'un robinet par minute.
- Lorsqu'une personne prend une douche de 10 minutes, elle utilise 151 L (40 gallons) d'eau.
- Une personne qui se fait couler un bain utilise en moyenne 75 L (20 gallons) d'eau.

Les Canadiens et Canadiennes utilisent 329 L d'eau par jour chacun.

- Pour chasser l'eau, une personne utilise 95 L (25 gallons) d'eau par jour.
- Les laveuses de vêtements traditionnelles (qui ne portent pas la mention ENERGY STAR) utilisent jusqu'à 189 L (50 gallons) d'eau par brassée.
- Un lave-vaisselle nécessite environ 53 L (14 gallons) par brassée.
- Un tuyau souple moyen requiert 492 L (130 gallons) toutes les 15 minutes.
- Quand vous lavez votre voiture, vous utilisez de 378 L à 606 L d'eau (100 à 160 gallons).

Source: <http://www2.ec.gc.ca/info-fact/index-eng.html>
 Questions générales sur l'usage de produits chimiques dans les jardins
 2010/09/01 10:00 AM
 http://www2.ec.gc.ca/info-fact/index-eng.html

Autres façons de conserver l'eau

- Fermez les robinets quand vous vous brossez les dents.
- Prenez des douches plus rapides.
- Réparez les robinets ou les lances d'arrosage qui fuient.
- N'utilisez pas la cuvette de la toilette comme une poubelle.
- Installez des robinets à débit réduit et des appareils électroménagers ENERGY STAR.
- Boitez les canalisations d'eau.

Pour avoir de l'information, communiquez avec EOS Eco-énergie 536-4487 ou à EOS@nb.abn.com.

Pour obtenir des renseignements sur les barils de pluie, contactez Eco-Container Co. au 506-379-2211, au 506-379-0678 ou à mackjack@rogers.com.

Eco-Container Co.

Ce projet est présenté par EOS Éco-énergie et subventionné par le Fonds de fiducie pour l'environnement du Nouveau-Brunswick.



Pourquoi conserver l'eau?

L'eau est l'une des ressources les plus précieuses au monde. Les gens s'en servent tous les jours pour broser leurs dents et laver leur voiture. On l'utilise également pour faire à manger et produire des vêtements.

Moins de 1 % de l'eau du monde entier sert à des fins humaines

En raison de la quantité limitée d'eau potable et de la hausse continue de la population, il est important de ne pas surutiliser les ressources que nous avons à notre disposition. Nous nous servons d'eau à un rythme plus rapide qu'elle ne peut se renouveler. On s'attend à ce que les changements climatiques entraînent des tempêtes plus intenses et plus fréquentes, mais à ce qu'il y ait aussi des périodes de sécheresse plus longues. Il sera donc nécessaire de conserver.

Comment conserve-t-on l'eau dans les barils de pluie?

Un baril de pluie recueille l'eau de pluie qui coule du tuyau de descente pluviale de votre toit. L'eau peut être utilisée de plusieurs façons, par exemple pour laver la voiture ou arroser le jardin – même un jardin de légumes! Vous pouvez ainsi épargner votre eau fraîche et vous en servir à d'autres fins.

En moyenne, un baril d'eau vous permet d'épargner 4900 L d'eau (1300 gallons) durant l'été, ce qui équivaut à des économies de 200\$ au compteur d'eau.

Barils de pluie et conservation de l'eau



Photo: Hydro-Québec. Photos de la vidéo consensuelle EOS & Eco-Container Co.

Avantages d'utiliser un baril d'eau

- Réduit la facture d'eau et permet de conserver de l'eau fraîche pour l'utiliser à d'autres fins.
- Aide à éliminer des endroits humides du sous-sol et à réduire la facture d'électricité lorsqu'une sous-pompe est installée.
- Le tuyau de trop-plein peut être dirigé vers le jardin pluvial pour aider à recharger et filtrer l'eau souterraine.
- L'eau pluviale est préférable pour les plantes et la terre.
- Vous aurez accès à de l'eau durant les périodes de sécheresse et les temps d'utilisation limitée.
- Contribue aux efforts de prévention de l'érosion et réduit les ruissellements de pollution.



Photo: Eco-Container Co.
 Source: <http://www2.ec.gc.ca/info-fact/index-eng.html>
 Questions générales sur l'usage de produits chimiques dans les jardins
 2010/09/01 10:00 AM
 http://www2.ec.gc.ca/info-fact/index-eng.html

Appendix Three – Newspaper Articles on the Rain Gardens





Sackville group using their green thumbs to fight floods

■ 300 Eco-Savers is planting several cubic gardens to slowly absorb water in flood zones

By [Name]

A group of 300 Eco-Savers is working to combat flooding in Sackville by planting several cubic gardens to slowly absorb water in flood zones.

The group is planting the gardens in areas that are prone to flooding, such as the area around the Sackville High School. The gardens are made of soil and plants that can absorb water, and they will help to reduce the amount of water that runs off into the streets during heavy rain.

The gardens will be planted in the next few weeks, and the group will continue to work on other projects to reduce flooding in Sackville.



Appendix Four – Selected Radio and TV Interviews

Global TV

<http://globalnews.ca/news/1447738/local-group-planting-rain-gardens-to-reduce-flooding/>

<http://globalnews.ca/video/1447826/rain-garden>

CBC Radio

<http://www.cbc.ca/news/canada/new-brunswick/tantramar-rain-gardens-designed-to-prevent-flooding-1.2685477>

Appendix Five – Rain Barrel Workshop Promotion



Appendix Six – Potential Rain Garden Lesson Plans for Teachers

Rain gardens make great educational spaces and now there are gardens at Salem Elementary in Sackville and Dorchester Consolidated School. Below is a collection of lesson plans and additional materials that show teachers how they can use the rain gardens to teach science curriculum.

Water Slow and Soil Absorption

Place a hose at the top of the garden (highest part of the slope). Let the kids watch where the water goes and how it falls into the garden (or doesn't). Let them see how it gets absorbed and the path it takes. Let them understand how the ground takes up water and they can see when it is unable to absorb anymore, how long it might take, why water doesn't travel up. You can have them time the absorption rate and compare different soils/areas around the school.

Resources and pre-made lesson plans:

- <http://www.atozteacherstuff.com/pages/515.shtml>
- <http://teachers.net/lessons/posts/187.html>
- <http://www.irwp.org/assets/conservation/rain-garden/Follow-the-Drop-2-2.pdf>



How the Garden helps to Filter Toxins from the Ground

The garden can be used as an example of filtering toxics from runoff and they can learn how rain gets into the ground water supply.

Resources:

- <http://www.ngwa.org/Fundamentals/teachers/Pages/Ground-Water-Introduction-and-Demonstration.aspx>
- <http://floridaswater.com/education/lessonplans/whatstheflow.html>
- <http://ecosystems.psu.edu/youth/sftrc/lesson-plans/water/k-5/rain-garden-1>

Worms and the Soil (The Cycling of Matter)

Use the garden and worms to show how one organism benefits other organisms. Have them guess why they are beneficial while they look around for some worms.



Resources:

- <http://www.earthwormsoc.org.uk/earthworm-information/earthworm-information-page-3>
- http://www.nacdnet.org/education/resources/soils/pdfs/worm&soil_facts.pdf

- <http://www.learnnc.org/lp/pages/1944>
- <http://soilweb.landfood.ubc.ca/youth/images/pdfs/LessonPlan3-EarthwormFarm-Oct2013.pdf>
- <https://www.naturewatch.ca/english/wormwatch/programs/lp1.html>

Seeing Flowers Grow

Have the students take pictures once a week or so to compare and have them explain what stage the flower is in at the time of the picture (used selected plants that are blooming in the late spring). Encourage them to come back over the summer to see other flowers grow and bloom.

Plants that would be good to use from the garden are: milkweed, goats beard, bloodroot, blue flag iris and marsh marigold. Get them to describe the difference between a flower and a weed, bloom times, parts of the flower, etc.



The Water Cycle

The garden can be used very easily to describe the water cycle and provide a close up example without going too far from the classroom.

Learning about Habitats (The School's Backyard Ecosystem)

They can see how this single garden provides habitat for many other species (bees, butterflies, etc.). Providing an example of how interconnected and dependant all the systems really are to each other. You can take them on a tour of the school and garden to identify different abiotic and biotic aspects.

Water Management

Rain gardens are in place to manage storm water runoff so it is a great opportunity to show them how water flows into the garden, off the roof, from less absorbent areas and into the garden. Have them look at other areas of the school and at storm drains to see how and where the water flows, how the landscape can be designed by humans to change how the water flows. Doing this on a rainy day would be great but would be more creative on a sunny day as they would have to guess where the water would flow.

Additional Resources for Teaching

- <http://www.irwp.org/education-and-outreach/rain-gardens-for-educators/>
- <http://ecosystems.psu.edu/youth/sftrc/lesson-plans/water/k-5>
- <http://nricd.org/studentlessons.htm>
- <http://www.clermontswcd.org/RGGuide.pdf>