

STREAMSIDE SKETCHES:
Stories of Water in Nova Scotia

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Introduction

Streamside Sketches is a collection of stories about water issues in Nova Scotia presented in a case study format. The stories highlight the environmental and social issues affecting Nova Scotia's watersheds, and provide examples of how community-based watershed stewardship groups are taking action to protect and manage water resources. The province of Nova Scotia is developing an Integrated Water Resources Management Strategy which will be unveiled in 2010. Streamside Sketches presents some of the wisdom and experience of community groups facing water quality issues, to provide background information for the Water Strategy development policy.

To develop these stories, leaders and coordinators of community-watershed groups were interviewed throughout the fall of 2008 and the winter of 2009. They were asked about the important areas of concern in their watershed, how they have or have not been addressed, who they have worked with and what their capacity is to access resources. The interview notes are summarized as one-page case studies followed by questions to encourage broader discussion and solution-building about water management in NS.

In addition to these case studies, the EAC will also prepare a water policy discussion paper outlining recommendations for how the province can implement watershed and coastal management in Nova Scotia. This discussion paper will be based on research, meetings, and workshops with other organizations and water and coastal experts, and released in the summer of 2009. This document will be a resource for watershed groups, the general public and the Water and Wastewater Branch of the Provincial Department of Environment. These policy recommendations will also be helpful for structuring the conversation during upcoming public consultations about the water strategy.

In early 2009, the province of Nova Scotia released a discussion document called "Water for Life" which groups water issues into four main themes: Human Health, Ecosystem Integrity, Economic Prosperity and Emergency and Hazard Preparedness. These themes emerge in the case studies in various ways, from economic losses resulting from the closures of clam harvesting areas on the Eastern Shore, to liming acidic rivers to restore salmon stocks to threats to human health from aerial spraying of herbicides near drinking water wells. The people living and working in the watersheds featured in these case studies are familiar with these issues. Their local efforts are protecting our health, our ecosystems, our economy our communities. The connections between human activities and water quality need to be understood by all Nova Scotians and decision-makers for the right policy choices to be made.

The Watershed Groups' coordinators bring a wide range of skill and experience to their organizations. They include fisheries biologists, farmers, teachers and long-term watershed residents. For groups that are collecting water quality monitoring information, more emphasis needs to be placed on developing standardized, replicable and scientifically sound monitoring protocols. Moreover the information needs to be collected in a central location to facilitate community, government and other watershed organization sharing, understanding and using the information. A striking issue is the need for governance structures to officially include water stewardship organizations into the provincial water policy. The benefits of having water

observers on the ground working in their watersheds are clear. In order for these activities to continue, they need to be framed within a governance structure that enables groups to access resources, build capacity and report to decision-makers through formalized avenues.

Streamside Sketches provides a look at water issues from nine watershed organizations across Nova Scotia: Antigonish Harbour Watershed Association, Amherst Wellfield Committee, St. Mary's River Association, Avon Peninsula Watershed Preservation Society, Cornwallis Headwaters Society, Eastern Shore Clam Fisherman's Association, Salmon River Salmon Association, Kings County Lake Monitoring Program, Mabou Harbour Watershed Stewardship Planning Process.

Antigonish Harbour Watershed Association

At the heart of the Antigonish Harbour Watershed Association (AHWA) are people trying to take care of the land and the water. As their director observes “water is the veins, blood and arteries of the land”. It is hard not to draw associations between the Antigonish Harbour Watershed and a pumping heart muscle both in terms of the hydrology and the volunteers whose energy runs the various environmental and social justice organizations in the area.

The connections between freshwater and the ocean are apparent in the Antigonish Harbour Watershed. The harbour has many feeder streams such as Brierly Brook, Wright’s River, West River and South River and the Association is interested in starting a monitoring program within these streams to measure changes and trends in water quality. Partnering with Estuarine Research Centre at St. Francis Xavier University and the Southern Gulf of Saint Lawrence Sustainable Development, the AHWA is running the Community Aquatic Monitoring Program in the harbour, which identifies and quantifies fish and crustacean species, measures parameters of water quality and aquatic vegetation profiles. Results from the monitoring program indicate that this shallow harbour tends toward eutrophication and there are signs of sea-level rise and eroding banks as a result of climate change.

The community’s concerns about the health of the Antigonish Harbour lead to the formation of the Association in 2007. The residents were concerned about a development that was proposed to be built at the shores of the harbour. The concern was that the development would be too close to the water and that the proposed sewage treatment facilities were not adequate to protect the ecosystem health of the harbour. There was sufficient pressure from the community that the developer withdrew the application. The residents were sensitive to such issues after a similar development project was approved which resulted in an area of land that was cleared and subdivided for residential development. Erosion of the road surrounding that land is a continual problem and results in high sediment loads to the harbour. Since their formation, the Antigonish Harbour Watershed Association has partnered with many other groups in Antigonish and elsewhere in Nova Scotia. They feel that being part of a network of environmental organizations is an important part of their work.

Echoing the concerns from other environmental organizations, the Antigonish Harbour is feeling the phenomenon of “death by a thousand cuts”. The coordinator observes that in addition to increased pressure from coastal developments, there are limited regulations for farmers plowing their fields up to the river’s edge, there are treated sewage outflows from the Town of Antigonish and impacts from twinning the highways such as sedimentation of streams and loss of habitat.

Questions:

How should the costs of supporting community-based watershed work, including water quality monitoring, organization and community education be shared between levels of government, community groups, and the private sector?

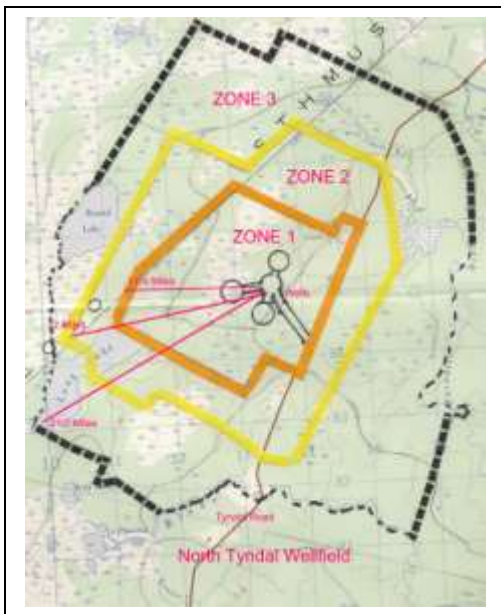
What are the best tools to track the cumulative impacts of poor land use planning and inappropriate developments on watersheds? How can this information be used to inform decision-makers?

Amherst Well Field Committee

Young at heart, George Maston from Amherst Nova Scotia has extensive experience in hydrology and water quality. He is a considerable resource on freshwater ecosystems, having worked at the Amherst Office of the Nova Scotia Geomatics Centre as a hydrologist for much of his career and spent many weekends paddling the waterways of the Herbert River Watershed.

The Amherst Well Field Committee was formed over a decade ago when the water quality in the Town of Amherst's water supply area was being affected by industrial development in the area. Maston's role as the community representative on the Well Field Committee has been instrumental in protecting the safety of the Town of Amherst's drinking water, but Maston himself admits there is lots of work that remains to be done.

A well field is a parcel of land within which are located a number of wells that pump water from an underground aquifer to supply a municipality. The well field encompasses the wellheads and the contributing lands¹. The current well field area for the Town of Amherst has three distinct zones designated 1, 2 and 3, as seen below.



Zone 1 is the area directly surrounding the four wellheads and Zones 2 and 3 are the lands directly exterior to Zone 1. Zone 1 belongs to the Town and is a protected area with very limited activity permitted, such as unauthorized use of motor vehicles. Zone 2 and 3 however are owned primarily by J. D. Irving. Private landowners and the Crown (managed by the Department of Natural Resources) also own portions of Zone 2 and 3. These two zones are located only 2 km from the wells.

The regulations governing what activities can take place in Zone 2 and 3 are much less restrictive. Members of the Well Field Committee feel there are environmentally harmful forestry practices occurring in these two zones that could affect the quality of the town's drinking water. Specifically, they are concerned with aerial spraying of the herbicide *Vision* which inhibits the growth of hardwood

species allowing softwood species to flourish, a more commercially viable species for pulp and paper.

At a Town Council vote, the Well Field Committee managed to temporarily stop the practice of herbicide spraying by a narrow margin of only one vote. But the issue has not been resolved since there is no set policy and Nova Scotia Environment grants permissions to conduct aerial spraying and to apply treatment.

¹ Young, Plummer and Fitzgibbon, 2009. "What Can We Learn from Exemplary Groundwater Protection Programs?" Canadian Water Resources Journal, volume 34.

The long-range effect of these herbicides is unknown as well as the potential for contamination of drinking water wells, the bioaccumulation of the chemicals in animal tissue or other compounding effects. Despite information received by the province that there is no harm in spraying, some community members believe that caution must be used to ensure the sustainability of the drinking water sources for years to come.

Questions:

Who has the right to determine best use of sensitive water areas: communities, government or forestry companies?

What responsibility do forest companies or other large scale commercial uses have to protect community drinking water sources?

How can municipalities protect drinking water sources that lie outside their direct jurisdiction?

How can we balance the interests of the community and the environment with those of large forestry companies when these companies have such a strong voice in municipal decisions in small communities?

St. Mary's River Association

The St. Mary's River "was historically one of the most important and prolific Atlantic salmon angling rivers in Nova Scotia" (SMRA, 2008). The low population density in the St. Mary's river watershed has had minimal impact on the St. Mary's River. However, changing land use patterns from forestry and agriculture within the watershed have caused habitat degradation and have greatly reduced population levels of endemic Atlantic Salmon. For the St. Mary's River, which prides itself on being a favoured fishing hole of past baseball legend Babe Ruth, this is bad news. This is why the organization's executive director and fish biology expert, Sean Mitchell has recently released a report entitled "Healthy River, Vibrant Communities". This report provides a five year plan for the St. Mary's River Association to develop an integrated watershed management plan and ecological restoration program.

In order to have a better understanding of changes in water quality in the St. Mary's River, the SMRA has been sampling six locations within the estuary using the Community Aquatic Monitoring Program in partnership with Dr. David Garbary from St. Francis Xavier University. Other monitoring work consists of conducting temperature surveys throughout the watershed and mapping these locations to try to identify consistent cold water habitat for salmon.

A considerable impact on the St. Mary's River has been from historical forestry practices, such as clear-cutting within the watershed. Reduced vegetation covers means water runs off the land more quickly without recharging groundwater aquifers and causes increased sedimentation in rivers. Since December 2007, NewPage Port Hawksbury, an FSC-certified forestry company has taken over lands along the Eastern Shore and in Cape Breton. FSC certification provides improved environmental guidelines for forest management, such as wider buffers surrounding streams and waterways and protection of biodiversity. For example one of the steps they have taken is to conserve a 300 meter buffer for wood turtle (*Glyptemys insculpta*) nesting sites during the nesting season.

Mitchell, who is also on the Board of the NS Salmon Association would like to see more collaborative work amongst the many other salmon

Nova Scotia Nature Trust St. Mary's River Legacy Campaign: The SMRA is partnering with the Nova Scotia Nature Trust in a project to protect land through private donation. The intention is to protect shoreline habitat, stabilize river banks, prevent erosion and build a green corridor along the banks of the river.

groups in the province, so they can pool resources, and expertise. In fact there was a workshop held in Truro recently to determine how they could work more collaboratively. They would also like to work more with other groups, especially with rivers that are similar to the St. Mary's.

Questions:

How can watersheds with low population density engage community members in watershed planning?

How can they encourage more sustainable development in a low population density watershed?

Avon Peninsula Watershed Preservation Society

Raymond Parker, President of the Avon Peninsula Watershed Preservation Society (APWPS) is a 3rd generation steward of Roseway Farm in Avondale, Nova Scotia. This 250-year-old-farm is located on the Avon Peninsula, which is bounded to the west by the Avon River, to the south by the St. Croix River and to the north by the Kennetcook River.

When describing the peninsula, Parker thanks God for this landscape where the residents and farmers live on the outside perimeter of the peninsula. On the high ground in the middle of the peninsula is a large forested area that acts as a big sponge buffer for the absorption and retention of water, with 19 feeder streams flowing through the landscape down to the tidal rivers. This area was traditionally referred to as the Commons and was an area where cattle could graze and people could harvest wood for domestic use.

This utopian landscape and the water that flows through it is facing a serious threat from a proposal to sacrifice the upland watershed to gypsum mining. Over the past several years a U.S. based company has assembled over 400 hectares for the proposed open pit mine. The proposed mine triggered the formation of the APWPS, which started in the fall of 2005. It began with a community process, four town hall meetings were held which were chaired by a community member and were very well attended.

A provincial environmental assessment is currently underway, to assess the impact of the mine. Beyond the 420 hectare scar on the landscape that the open-pit mine would create, the consultants hired by the proponent to write the mine proposal have acknowledged that 12 of 15 streams directly affected would have their catchment area decreased by up to 50% and there would be a similar impact on wetlands.

Because of its biodiversity and unique karst geology, the Avon Peninsula has been ranked as one of the highest areas in the province deserving of wilderness area protection by similar criteria used by the Colin Stewart Forest Forum process. Parker is concerned about groundwater vulnerability because of the geology of the peninsula, composed mainly of karst, a porous material similar to limestone. In terms of water quality and quantity on the peninsula Parker remarks that it is already a constrained water regime and as a result people have adapted to their own hydrological conditions. Residents and farms get their water through a combination of dug wells, deep wells, streams, cisterns, ponds, etc.

As their contribution to the provincial environmental assessment process Parker and his organization have begun a community-based environmental assessment that has involved lots of mapping and identifying unique flora and fauna, water supply areas, and agricultural land. They have found American eel and speckled trout in their streams; there are bat caves in the crevices of the land and small-scale farming operations that have been long-time stewards of the land.

Question:

What can be done to expose the risks of contaminating groundwater when they are not clearly evident?

How can local knowledge be incorporated into environmental assessments?

How can provincial economic priorities coincide with the need for sustainable and prosperous communities?

Cornwallis Headwaters Society

The society, formed in 2007 has been tackling water quality in the Cornwallis Watershed where 60% of the land is dedicated to agriculture. Farmers have traditionally received much of the blame for poor water quality, but the Cornwallis Headwaters Society (CHS) is working with the provincial and federal agriculture department to help ensure improvements in stream water quality. These farmers see themselves as stewards of the land from which their livelihood depends.

The CHS is encouraging farmers within the watershed to adopt Beneficial Management Practices (BMPs) with incentives from the Farm Investment Fund, a joint provincial and federal funding program. Six farms within the watershed are already implementing BMPs. These practices largely involve water conservation efforts and reducing the presence of cattle in rivers. These are achieved through culvert crossings, cattle bridges, solar water systems, wind-powered water systems, fencing cattle out of rivers, nose pumps for cattle, offsite watering, etc.

Bacteriological contamination from cattle and nutrient loading from agricultural runoff are the primary issues within the watershed. Water quality monitoring programs are underway in the Cornwallis watershed. There are 10 sampling sites in the watershed, including within the lower reaches of the Cornwallis River into which both the Fisher Brook and Thomas Brook flow. Water quality tests include measuring E. coli levels, nitrates, phosphates, total suspended solids, pH, flow, temperature, salinity and conductivity. The Thomas Brook Project took the lead in setting up the 10 monitoring sites with help from Acadia University. These organizations have also partnered in other projects such as riparian management, monitoring of migratory birds and invertebrate sampling within streams.

The Society believes that regional offices of the Department of Environment are overly focused on regulations and enforcement and there is a sense that the field staff is not receptive to providing innovative and helpful solutions for farmers. They would like to have access to education and training, resources as well as expertise that can work with the farmers in order to provide them with opportunities to help reduce their impact on water. The feeling amongst farmers in the watershed is that there are few places to obtain information. This lack of information and innovation handicaps the agricultural industry and creates additional barriers to improving water quality.

Areas that the CHS would like to influence include revitalizing wells and spring, improving on-site septic treatment, improved irrigation and stabilizing riverbanks, all of which will help to improve water quality on the farm.

Questions:

Agriculture is an essential component of Nova Scotia's economy and with consumers choosing local food over imports, how can we ensure agricultural producers can strive to achieve more environmentally sustainable practices?

How can Nova Scotia Environment transition to provide training, education and incentives rather than enforcement to achieve good water quality?

Eastern Shore Clam Fisherman's Association

Closures of clam harvesting areas have had a serious impact on coastal communities all over Nova Scotia. According to the Genuine Progress Index Atlantic study shellfish closures have more than doubled in the last 15 years representing \$8 million a year in lost revenues. Between 1996 and 2000, the closed shellfish area has increased by 38%². The issue of closed clam harvesting areas has galvanized the clammers in the Chezzetcook and Eastern Shore region. Clam areas are closed for harvesting because bacterial contamination caused by land-based impacts such as faulty septic systems, inappropriate development in the upper reaches of the watershed, and sewage outflows. The Eastern Shore Clam Fisherman's Association was formed to work better with government agencies such as DFO and to address the issue of bacterial contamination and closures of clam harvesting areas.

The Eastern Shore fishery, also known as CH5 spans from Pennant Point to Canso, and the Eastern Shore Clam Fisherman's Association actively harvests between Pennant Point and Jeddore Cape, a distance of approximately 100 km. Unlike the clam fishery in the Annapolis Basin, clammers on the Eastern Shore harvest only softshell clams which are found in what they call gullies, or little harbours or coves where there is a mixture of soft mud, sand and rocky habitat. They are sometimes only accessible by boat during certain times of the year.

Harbours such as Chezzetcook and Clam Harbour were traditionally very rich clamming areas, however their narrow shape and various road crossings have restricted the tidal flow into the inner harbour. Pollution has accumulated in Chezzetcook Harbour because of the low flushing rate and as a result, the inner harbour has been closed for clamming for almost 20 years. The bridge in Cole Harbour has washed out in the past and has been replaced with a post bridge but the Association would like to see a span bridge in place over the harbour to allow for better water exchange between the upper and lower harbour.

There are approximately 65-75 members of the Eastern Shore Clam Fisherman's Association and they meet on a yearly basis to vote on the opening of various harvesting areas. With a total of 80 active clamming licenses, they are not issuing any new licenses and there is a freeze on transferring licenses.

For the last 10 years there has been a Memorandum of Understanding with the Canadian Food Inspection Agency, Environment Canada and the Department of Fisheries and Oceans and the Eastern Shore Clam Fisherman's Association to allow for conditional clamming in the outer reaches of Chezzetcook harbour. The harbour has three test sites and in order for the conditional harvesting to occur, there needs to be two clean tests of water and clam meat. The tests occur every 14 days. If there is one bad count where the levels of contamination surpass the acceptable limit the harvesting area is closed.

Members of the Association participate in the testing with Environment Canada and they have observed that the water quality in the harbour is severely degraded after a heavy rainfall and the harvesting will shut down. The Association would like to work on a harbour revitalization

² Wilson, Sara Justin, 2000. "The GPI Water Quality Accounts" *GPIAtlantic*. Accessed online: <http://www.gpiatlantic.org/pdf/water/waterquality.pdf>

project to reduce the bacterial load entering the harbour from faulty septic systems, but with strictly volunteer effort and limited time such a project has been difficult to put in place.

Questions:

The local economy along the Eastern Shore could see an important surge in fisheries if clam harvesting areas could be reopened. What will instigate decision-makers to take action?

How can we catalyze action on particular issues?

What can be done to reduce watershed residents' impacts on the coastal waters?

Salmon River Salmon Association

The Metaghan River Watershed is one that has been highly impacted by the effects of acid rain. Although the frequency and severity of acid precipitation has decreased since the early 1990's, the impacts are still felt throughout the rivers in the watershed. Acid precipitation has largely come from the eastern seaboard of the United States, with states such as Pennsylvania still burning significant quantities of coal for electricity generation every year.

The Salmon River Salmon Association (SRSA) has recently completed a 4 year study to determine the effect of liming the land surrounding rivers and watercourses to neutralize acidification effects. The Atlantic Canada Opportunities Agency (ACOA) helped to fund this terrestrial and aquatic ecosystem study. Within the Metaghan River watershed, Black Water Brook has been severely impacted by acid rain, with pH measurements of 4.5 to 4.8 and sometimes less than 4. Water quality monitoring work done by the association includes macro-invertebrate sampling and pH testing. They have also done restoration work, such as installing rock sills on the Salmon River which help to improve the habitat for salmon. Fifty-four rock sills have been installed in total in Weymouth, Yarmouth and Tusket.

Roland Leblanc, co-director of the Salmon River Salmon Association is also concerned about mink farms in the watershed. Nitrate and phosphate runoff from mink manure found on the mink farms have had negative impacts on river water quality. The SRSA have contacted the provincial department of agriculture but have been unable to speak to anyone about the problem. Leblanc feels that the mink farming operations are under-regulated and have been given too many leniencies in this rural Acadian community. The SRSA would like to see better management of manure on-site and increased riparian buffers to absorb the nutrient runoff.

Above all Leblanc believes that watershed management plans for the province are essential and that more education and outreach is needed in rural watersheds to inform the population about the pressures facing their watersheds. He hopes such attempts will help get more community members involved in watershed management.

In the community

Roland Leblanc also teaches a hands-on Environmental Science class for students in grades 11 and 12 at the École secondaire de Clare. Throughout their course the students learn how to conduct a salt profile, measure pH in soil, study hydrology and flood frequency as well as calculating culvert sizes and installing them in waterways. Their school is also equipped with an aquarium and fish hatchery and where students can study fish life cycles and partake in stocking of fish in rivers.

Kings County Lake Monitoring Program

The Kings County Lake Monitoring Program is a unique example in Nova Scotia of a municipality partnering with volunteers who collect water quality samples from 11 lakes within the Gaspereau Watershed located within Kings County. Andy Bryski has been a volunteer for over a decade with the lake monitoring program and is the Chairman of the Aylesford and Loon Lake Property Owners Association on the lake where he lives. Bryski believes strongly in the need to protect water quality through tracking changes and trends in lake conditions, grassroots participation and education via property owners associations. Threats to lake water quality stem from bacteriological contamination from inadequate on-site septic systems causing algal blooms in the lake which lead to decreased dissolved oxygen levels and eutrophication.

Kings County adopted the lake water quality monitoring program based on a model from Ontario in order to determine lake capacity and the level of development that should be permitted. To ensure the water quality monitoring data remains pertinent and useful to the county, they have hired a consultant to identify practical links between lake water quality and land-use planning. The planning office is not able to stop development from occurring in the county, they can however enact by-laws to ensure new developments meet stricter building standards, such as a minimum setback of 65 feet from the lake, maintaining vegetative covers along the shoreline and by-laws for new vegetation, and receiving septic approvals.

The water quality monitors believe a well researched and vigorously enforced Province-wide system to protect watersheds is needed. By imposing rigid requirements on development now, future ecosystem damage as a result of ‘grandfathered’ constructions could be averted. As Bryski observes, it is very easy to destroy aquatic ecosystems because of their fragile nature, it is very difficult and near impossible to restore them to their former selves once the harm is done.

Herbicide Spraying: According to Bryski, forestry companies sprayed almost 1,000 acres in the Gaspereau watershed. The Aylesford and Loon Lake Property Owners Association made requests to the Minister of Environment to restrict such activities but these requests were ignored. Bryski felt that the decision to allow the spraying went against proper democratic process. He believes Nova Scotia should proceed with caution with regard to aerial spraying of herbicides and hold off on further spraying until the long-range effects of these chemicals on society and the environment are better understood.

Deterioration in water quality will have ramifications for human health, recreation and tourism as well as ecosystem integrity. Bryski would like to see Nova Scotia Environment take more guardianship of water quality and environmental issues. Better education about septic systems for instance and taking a stance against aerial spraying of herbicides. Overall he feels NSE needs to be perceived as more of a friend than a foe, and promoting themselves through partnerships so citizens feel they can approach the department and work together to find sustainable solutions. With the help of the water quality monitors Kings County has been distributing a newsletter to provide educational tips about proper maintenance of septic systems.

Questions:

How can municipalities in other jurisdictions work similarly with community groups to facilitate monitoring as it informs land-use planning decisions?

Mabou Harbour Watershed Stewardship Planning Process

The Mabou Harbour Watershed Stewardship Planning Process is another excellent example of a watershed organization that is using a multi-stakeholder process to improve water quality and do watershed research and planning. Their project demonstrates what can be accomplished when resources are put into a full-time coordinator who can help projects move forward. With a primary focus on education and stewardship the organization has done extremely well in engaging the community in the watershed planning process. They have also spent time fostering collaborative relationships with all levels of government as well as water users and stakeholders. Utilizing resources from St. Francis Xavier University, they are providing a hands-on learning environment for researchers and students while benefitting from the outcomes of the students' research and project reports. In a watershed where many residents feel there is a lack of data about sources of contamination to the watershed and harbour, working with an academic institution is a significant gain.

In order to ensure a clean water supply and healthy watersheds for all users, the Mabou Harbour Watershed group initiated a planning process taking place between 2006 and 2008. The steering committee of the process is composed of twelve volunteer community members. Their operational principles are collaborative and focus on finding positive and constructive means of sustaining a healthy watershed and community³. On the course of achieving this objective they have partnered with Agriculture Canada, Environment Canada, the Rural Secretariat, the Habitat Branch of the Department of Fisheries and Oceans, and the Nova Scotia Salmon Association Adopt-a-Stream program.

A focal area of interest for the Mabou Harbour Watershed group was closures of shellfish harvesting areas due to E. coli contamination, dating as far back as 1986. Besides bacterial contamination, some of the other issues affecting the harbour include sedimentation and siltation which could be linked to agricultural and urban development⁴. Both agricultural and urban development result in loss of vegetation roots causing destabilization in stream banks. Infilling of the harbour from sedimentation affects navigability as well as species habitat, especially bottom-dwelling species like lobster or oysters⁵. Encouraging riparian buffer zones along stream and river banks can be very effective in fortifying stream banks and slowing run-off rates.

Monitoring and restoration work being done in the harbour watershed includes water quality & invasive species monitoring through the Community Aquatic Monitoring Program (CAMP), stream restoration, water quality sampling and eelgrass and sea lettuce monitoring. Results from this ecological monitoring

Beyond Water:

The community of Mabou has also identified social and economic challenges including a need for public education around littering and waste disposal and changing demographics and outmigration. They are also examining the possibility of oyster aquaculture in the harbour provided it does not affect their recreational or navigation abilities.

³ Geochemistry of Natural Waters Class (ESCI 305), St. Francis Xavier University, 2007. "Investigations of Water Chemistry in Mabou Harbour and Inflows". Accessed online:

http://mabouwatershed.com/Reports/2006_Mabou_StFX_ESCI305_Harbour_Report.pdf

⁴ The Mabou Harbour Watershed Stewardship Plan Community Steering Committee, 2007. "The Mabou Harbour Watershed Stewardship Plan, Phase 1". Accessed online: <http://mabouwatershed.com/Reports/MHWSPPH1.pdf>

⁵ *Ibid*

work have been used to inform the Integrated Coastal Zone Management Plan for the Mabou Harbour and watershed.

Questions

How can other groups benefit from the experience of this organization in working in an integrated way, leveraging government funding and using community capacity?

The quality of work that can be accomplished when there is support to do research and bring people together is noteworthy.

Conclusion

A central thread from many of these Streamside Sketches and questions that were frequently raised was the need to balance economic activity with the interests of the community and the environment. Economic development in this province has traditionally taken the lead at the expense of healthy communities and clean water, air and soil. In fact this type of development should not even be considered as economic development since the costs to present and future generations are so great. This raises a key issue that deserves being reiterated which is that the environment and the economy are inextricably linked and that a prosperous economy will be impossible without a clean environment.

Governments need to recognize this interconnection and take action by investing in our natural capital such as rivers, lakes, wetlands, beaches and salt marshes which provide invaluable ecosystem services including water filtration, habitat provision, sediment and nutrient transport and buffering the impact of climate change along our vulnerable coastlines. Investing in our natural capital saves money by reducing infrastructure costs and can help stimulate the economy by providing more jobs in rural communities, such as reopening closed clam harvesting areas.

As the province of Nova Scotia is trying to foster prosperous economies in rural areas they should be considering the benefits derived from an active civil society that is working to care for their water resources and environment. In order for their work to be sustained over the long term, volunteers in watershed organizations need to feel that their work is useful and improving water quality. As such they require support for their work, access to resources and they need to operate within a supportive governance structure where they can report to decision-makers through formalized avenues.

As was discussed in the case study from the Cornwallis Headwaters Society beneficial management practices are being implemented on a small scale in agricultural watersheds. Beneficial management practices need to become the norm within the agricultural sector as well as all other sectors including forestry and development. Tools for mapping degraded rivers and streams within watersheds have been developed and are being used in agricultural watersheds in order to target restoration to areas that exhibit the greatest need. These tools need to be used more widely and be adapted for a diversity of sectors.

Finally, it is important to recognise that the timeline for participating in the public debate on the provincial water strategy is now. The more informed the public and watershed organizations can be on the components of a strong water policy, the more likely these components are to be found within the policy. Therefore it is essential for the public and watershed organizations to become involved in the conversation. We all want clean water, salmon in our rivers and river and estuarine habitats that can buffer the effects of climate change, we also have a good idea of what we need to do to get there. What we're missing is strong leadership and a desire to collaborate with multiple sectors in order to have a comprehensive water policy that achieves the vision we've set for our watersheds.