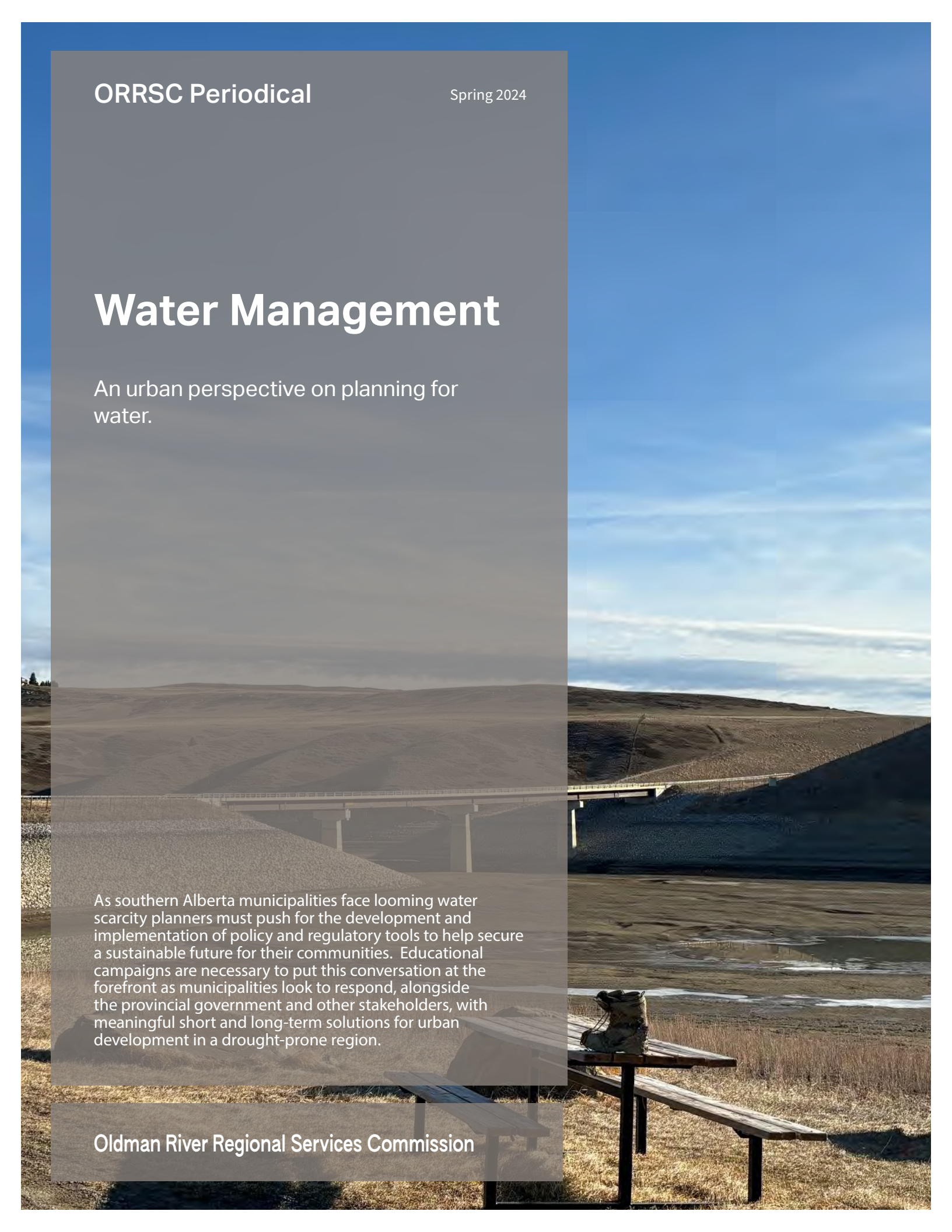


Water Management

An urban perspective on planning for water.

As southern Alberta municipalities face looming water scarcity planners must push for the development and implementation of policy and regulatory tools to help secure a sustainable future for their communities. Educational campaigns are necessary to put this conversation at the forefront as municipalities look to respond, alongside the provincial government and other stakeholders, with meaningful short and long-term solutions for urban development in a drought-prone region.

Oldman River Regional Services Commission



Water Management Context

The 2003 Water for Life Strategy initiative sought to focus the conversation on water management. Through the Alberta Water Futures: Risks and Opportunities for Water Management, Perspectives Report, June 2021, the large players in the management strategy have acknowledged that “further work is warranted [and] we need to look ahead, plan, and to take action to shift from being a predominantly reactive water management system to one that is more proactive, thereby ultimately increasing the resilience of the system to future risks.” The water crisis of 2023 where water had to be hauled to communities in the Municipal District of Pincher Creek because the Oldman River Reservoir intake was dry highlights the need for a proactive stance. It is not so much that water issues have changed; it is that in the cyclical reality of southern Alberta’s semi-arid climate, we get lulled into an over appreciation of the wet years as the norm and perhaps misunderstand why the southern basins were closed to new water licences in the first place.

Alberta’s existing water transfer system currently allows for the re-distribution (trading) of water licences between different water users, under certain conditions. The current system has several public policy protections: a public review of every water transfer, the consideration of hydrological and third-party impacts for each transfer, and the opportunity for the province to hold back 10 percent of the allocation for environmental in-stream purposes.

At the municipal level, governing water use decisions has always been a matter of balance between economic growth and licensed allocation. Hidden within the notion of some users is the idea that water is a virtually free subsidy with few guard rails on development-related consumption. The true cost of water is however increasing for urban populations. It cannot be overstated that if you are planning for land use you are by default planning for water and therefore should place an emphasis on the effect the planning approval would have on water availability for other uses and users. This periodical will examine the role urban municipalities have as partners in water management and in making land use decisions that affect water usage in southern Albertan urban communities.

Climatological Context

A semi-arid climate is a dry climate sub-type. It is located in regions that receive precipitation below potential evapotranspiration, but not as low as a desert climate. There are different kinds of semi-arid climates, depending on variables such as temperature, and they give rise to different biomes. Southern Alberta is considered a cold semi-arid climate. Cold semi-arid climates (type “BSk”) tend to be located in elevated portions of temperate zones generally from latitudes in the mid-30s (Oklahoma City) to low 50s (Red Deer), typically bordering a humid continental climate or a Mediterranean climate. They are also typically found in continental interiors

What is a Water Licence?

A water licence is required for any individuals wanting to use or divert water in Alberta (with few exceptions). From business to individual use, the regulations apply if one wishes to use ground or surface water. Since August 2006, portions of the South Saskatchewan River Basin have been closed to new water licence applications, except for First Nations, Water Conservation Objectives (WCO), and water storage projects (as per an Approved Water Management Plan). This moratorium on the issuing of new water licences has created Canada’s first market-based system to transfer (trade) water licences.

Source: Alberta Water Portal Society



Emergency intake facility at the Oldman River Reservoir for nearby urban communities.

Alberta uses an allocation system referred to as FITFIR (First-in-Time, First-in-Right). This system uses 'priority' as the determining factor in certain water-specific situations. Priority is the date and time number assigned to a water allocation and is recorded on the licence. Under Alberta licensing, there is no priority given to the specific use. However, the priority number indicates seniority in times of shortage and is the First-in-Time aspect of FITFIR. This means when there is not enough water for all the licencees, the oldest licencees get their water before the newer ones.

Allowing seniority protects existing licencees from shortages created by new users and also reminds new users not to be wasteful. Under this system, the more junior your licence, the greater the risk of not receiving all or part of your allocated water in low water years. However, during emergency situations, the government has the power to suspend a water licence and redesignate the water for other uses. A licence can also be cancelled for non-use or non-performance of a condition of a licence; however, there is no record of this occurring to date.

Water Conservation Objectives established under the provisions of the Water Act:

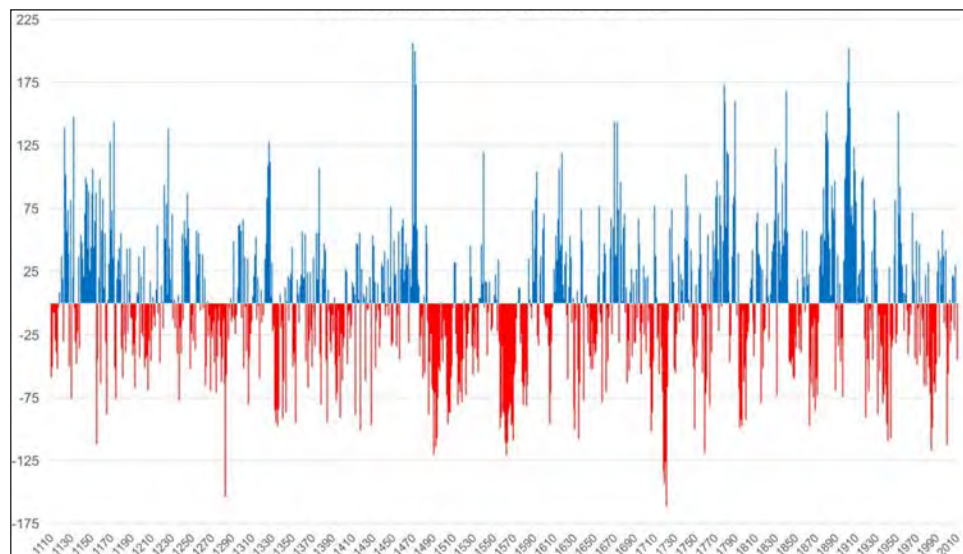
- protection of a natural water body or its aquatic environment, or any part of them;
- protection of tourism, recreational, transportation or waste assimilation uses of water; or
- management of fish or wildlife.”

Generally, a water conservation objective can be expressed in relation to a rate of flow needed or a water level needed.

some distance from large bodies of water. These areas usually see some snowfall during the winter, though snowfall is much lower than at locations in similar latitudes with more humid climates.

Drought is something that has occurred regularly in this region (for example, over 40 droughts have affected western Canada over the last two centuries). Over the last nine hundred years, the Prairie Provinces have experienced several decadal droughts, several multi-decadal droughts, and large flood event years (see Figure 1 where red represents drought years).

Figure 1: South Saskatchewan River: Water-Year Flow



Legislative and Policy Context

The legislative and policy documents governing water begin with the South Saskatchewan Regional Plan under the *Alberta Land Stewardship Act* which references the *Water Act*, Water for Life, and the Approved Water Management Plan for the South Saskatchewan River Basin.

The *Water Act* supports and promotes the conservation and management of water, through the use and allocation of water in Alberta. It requires the establishment of a provincial water management framework and sets out requirements for the preparation of water management plans. The Act addresses: Albertans’ rights to divert water and describes the priority of water rights among users; and the types of instruments available for diversion and use of water and the associated decision-making processes. It also includes the range of enforcement measures available to ensure the goals of the Act are met. Water-related legislation is of particular note, given that water-based amenities are common in urban campgrounds, where riparian environments, wetlands, navigable waters, and fish-bearing watercourses exist, supported by their respective acts and regulations.

The water management plan for the South Saskatchewan River Basin

recommends a balance that is broadly acceptable to the public between water consumption and environmental protection, in light of economic and social objectives and ecological necessity. The plan envisions future management in the basin combining innovative, efficient and productive water use and improved management of aquatic ecosystems.

Alberta is the first province in Canada to introduce the ability for a licensee to transfer all or part of its allocation on a permanent basis. The water, however, cannot be a new allocation, only an unused portion of an existing licence. The licence holder must demonstrate how their actions result in a reduced need for water (surplus water that has never been used could not be sold). Applicants can only obtain water through a licence transfer if they demonstrate a need for it. What has rarely played out in southern Alberta is the commodity sale of allocation for a development the scale of Cross Iron Mills mega-mall in Rocky View County (north of the City of Calgary). The mall was the first large-scale cash-for-water-rights transfer in the province of Alberta. Thus, began the first steps toward a market system that distributes water based on one's ability to pay.

The cost of urban bulk water may soon be a burgeoning battleground, but managers of water systems are just as concerned about upstream users and their contaminants which are adding to the overall cost of cleaning the water for consumption. Simply put, high-quality source water is less expensive to treat. Most provinces now appear to recognize the importance of developing plans that protect source water. In view of this, support of the Oldman Watershed Council and similar organizations could be viewed as an important partner to urban balance sheets.

Land Use Planning

In Canada, there are millions of lawns; watering them accounts for about one third of all residential water use. In a quick overview of Oldman River Regional Services Commission urban member planning documents, it was found that the term xeriscaping only occurred in 7% of current documents. Fewer still list the recommended drought-tolerant plants that should be encouraged for landscaping requirements on all permits. The resulting position is that landscaping is carried out on an individual's personal preference with limited interaction on the part of municipalities for approval of a landscape plan, an inspection of the installation, or follow up as a condition of development. The result may be perpetuating the use of water resources for extensive lawn growth in residential areas.

In industrial and commercial development areas the nature of development and expense of landscape turns on its head and is likely to be forgotten or limited resulting in barren streetscapes and seas of hardscape with little appeal and no relief from the sun. When successful, commercial settings often complete the necessary requirements with cubic yards of landscape gravel and drip irrigated plantings. The use of drip irrigation when maintained is a water saving approach to landscaping especially when feeding drought-tolerant plants suited to commercial environments.

In an article for Scientific American Krystal D'Costa writes: "The state of a homeowner's lawn is important in relation to their status within the community and to the status of the community at large. Lawns connect neighbors and neighborhoods; they're viewed as an indicator of socio-economic character, which translates into property and resale values. Lawns are indicative of success; they are a physical manifestation of the American Dream of home ownership. To have a well maintained lawn is a sign to others that you have the time and/or the money to support this attraction. It signifies that you care about belonging and want others to see that you are like them. A properly maintained lawn tells others you are a good neighbor. Many homeowner associations have regulations to the effect of how often a lawn must be maintained. So important is this physical representative of a desired status that fines can be levied if the lawn is not maintained."

Krystal D'Costa, "The American Obsession with Lawns," Scientific American, A Division of Springer Nature America, Inc., May 3, 2017, <https://www.scientificamerican.com/blog/anthropology-in-practice/the-american-obsession-with-lawns/>

Just beware of a big misconception about xeriscaping: It means making landscapes more waterwise and appropriate for the local environment. It doesn't mean pulling out all the grass and replacing it with gravel. But lawns that include too much grass, the wrong type of grass, or grass in a bad spot require more water and maintenance than is sustainable. When you think about lowering water usage and lawn care, start with these steps before perusing the easy-care lawn alternatives that follow.

Thinking about replacing your grass lawn? Here are small steps you can take to get started:

- *Removing turf areas on slopes, where water runs off.*
- *Taking out narrow strips of grass, especially in "nuisance strips" near the sidewalk.*
- *Evaluating whether your turf is made of high-water-use grass mixes.*
- *Removing grass in corners of the lawn, or awkwardly shaped areas that are difficult to water and mow.*
- *Getting rid of grass along fences.*
- *Keeping appropriate use of grass lawns, like the areas where the kids play, helps cool patios and the house.*
- *Reducing the amount of grass on your property, especially where it doesn't grow as well (like under trees).*

With a deeper look at commercial and industrial land use, it is a worthy exercise for council and its planning staff to discuss land uses that require large quantities of water. Simple solutions like water recycling may be logical in the development of uses like car washes. Other uses could quite blatantly be inappropriate given local circumstance. The Town of Stavely recently removed the use of Cannabis Production Facility after the existing approved facility was found to be using 4 times (equivalent to the volume used by 180 households) its original development approval for water.

Historically, servicing projections were seldom put under the microscope at the time of development permit, but the state of the basin suggests that municipalities should begin looking closer at forecasting water use for individual developments. Without the benefit of a water master plan linked to future land use, restricting the development of large water users is a rather blind exercise. One of the most thorough water shortage response plans comes as part of the conversion of the temporary water licence to a permanent licence for the Claresholm Industrial area. A joint Water Shortage Response Plan (MPE, 2020) was adopted in August of 2020 between the M.D. of Willow Creek and the Town of Claresholm (subsequently added to the Town Water and Sewer Utility Bylaw). The plan was done as a requirement of Alberta Environment to receive the water licence. The M.D. of Willow Creek (including the Hamlet of Granum) and the Town of Claresholm have agreed to jointly implement the response plan and to issue joint media releases as the triggering criteria of the Pine Coulee Reservoir operating levels are reached.

From the normal full supply level of the reservoir, a five stage system of restriction was created as the water level declines. This system is applied to broad land use categories which include residential, commercial, public and agriculture. In the initial stages, water restriction for lawns moves from three days a week to a complete stop at a Stage 4 and 5 where reservoir levels are critically low. As one might expect several other residential activities are also curtailed at the critical levels, including pool and water feature top ups, vehicle washing, and spraying of outdoor surfaces.

The policy in addressing commercial business curtails water for aesthetic use on exterior cleaning and lawns, but it also addresses select businesses whose use of water is integral to their livelihood. At the Stage 4 restriction businesses with retail lawn, garden and plants must cease and car washing must stop at Stage 5. Hard reality for aesthetic based businesses, but in the context of water need for human/livestock consumption and firefighting as the Stage 5 allowable uses it is understandable.

Water Conservation as a Complete Multi-Departmental Approach

Land use planners have a role in the documents they help craft, but in water reduction policy there is a need for all levels of local governance to

participate. Many actions may already be addressed such as investing in water line replacement to eliminate water leaks in outdated infrastructure. Other policies may include:

- a re-evaluation of efficient water uses in public spaces and parks. Park space audits which include an evaluation of active and passive use and should be aware of the neighbourhood needs for the park;
- a street tree management and replacement program that chooses drought-tolerant species;
- furthering public education on the best practices for reduction of water on residential properties including how to design landscaping for drought tolerance with xeriscaping and encouragement of rainwater collection for use on landscaping;
- the installation of a demonstration garden that shows what can be achieved with minimal lawn;
- a rebate on water efficient household fixtures and/or appliances;
- ensuring all users are metered and that the water rates have been recently reviewed as the price of water has a major influence on the amount of water used by households. For example, in 2009, Canadian households with meters on volume-based pricing schemes used 73% less water than unmetered households on flat-rate pricing schemes.

In a search of ORRSC urban municipalities' water bylaws and websites, the results show that although all municipalities have rules regarding tampering with the water system and meters, only four have implemented water restriction protocols with a fine mechanism for enforcement. Most of the remaining urban municipalities had some form of public notice encouraging voluntary water use reduction. Water consciousness through education can have the biggest impact on water usage. As an example, the City of Brooks has published a citizen guide for 100 ways to reduce water.

Where land use planners have access to the information of other departments, this information can be fed back into land use planning documents. A municipal development plan can emphasize these other programs and provide land-based estimates for water use.

Concluding remarks

Some may argue that the management of irrigation allocation (currently licensed in the Oldman watershed for 73% of the total licensed amount) would provide a larger impact on the availability of water. But before southern Alberta gets to the critical decisions of transfers, being paid to remove lawn, or enforcing water efficient equipment for businesses and residences, there are efficiencies that a reduction in use can provide for urban construction and growth of the economy ...until it doesn't. Our American neighbours are playing out these policies on a big economic scale and agriculture is seeing the biggest losses in livelihoods as more water is allocated to human survival in metropolitan cities. Urban and rural entities end up owning that reality in increased food costs and loss of local revenues. If planning for land is planning for water, then every drop of water counts and so should our collective attitude toward it.

Alberta showed a 56% increase in water lost through the distribution system between 2011 and 2021 equating to 70.4 million cubic meters in 2021.

Source: Statistics Canada. Table 38-10-0271-01 Potable water use by sector and average daily use



Xeriscaped public space in the Town of Claresholm

For more information on this topic contact admin@orrsc.com or visit our website at orrsc.com.

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