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# Going With the Flow? Evolving Water Allocations and the Potential and Limits of Water Markets in Canada

ENERGY, ENVIRONMENT AND TRANSPORTATION POLICY



Going With the Flow? Evolving Water Allocations and the Potential and Limits of Water Markets in Canada  
by *Oliver M. Brandes, Linda Nowlan, and Katie Paris*

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## Preface

Canadians are just beginning to understand that fresh water is both precious and scarce. Renewable freshwater is approaching full allocation in many regions. This has prompted debate on reforming water allocation policies to promote the long-term sustainability of our renewable freshwater resources.

This report describes some of the key mechanisms available to allocate water in times of scarcity, with a particular focus on markets and market mechanisms. It highlights some of the advantages and disadvantages, as well as recent experiences in jurisdictions—such as Alberta—that have begun to include markets formally in their water allocation framework.

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### **PRACTITIONERS INTERVIEWED**

Anne Laganiere, Coordinator, Surface Water Management, QIT Fer-Titane, April 18, 2008

Dave McGee, District Approvals Manager, Alberta Environment, April 10, 2008

Tara Payment, Research Analyst, Canadian Association of Petroleum Producers, April 16, 2008

Andrew Purkey, Director, Columbia Basin Water Transactions Program, April 23, 2008

F.A. (Rick) Ross, Executive Director, Canadian Water Resources Association, April 15, 2008

Nancy Stalker, Leader, Community and Customer Initiatives, Water Resources, City of Calgary Water Works, April 24, 2008

Peter Yolles, Consultant, Water Insight, Marin County, California, April 14, 2008

### **REVIEWERS/INFORMANTS**

In addition to the listed interviewed practitioners, the following experts and scholars provided input through informal discussions and detailed draft reviews at various stages throughout the project.

Nigel Bankes, Faculty Chair of Natural Resource Law, University of Calgary

Henning Bjornlund, Canada Research Chair in Water and the Economy, University of Lethbridge, and Associate Research Professor, University of South Australia

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Randy Christensen, Staff Lawyer, Ecojustice Canada

Rob de Loe, Canada Research Chair in Water Management, University of Guelph

Michael M'Gonigle, Eco-Research Chair in Environmental Law and Policy, University of Victoria

Tim Morris, Programme Officer, Fresh Water Resources Protection, Walter & Duncan Gordon Foundation

Ralph Pentland, Acting Chair of The Canadian Water Issues Council, founding member of FLOW-Canada and the Gordon Water Group, and President of Ralbert Enterprises Inc.

## About the Authors

Olivier M. Brandes is the Associate Director and Water Sustainability Project Leader for the University of Victoria's POLIS Project on Ecological Governance; Linda Nowlan is an environmental lawyer and Faculty Research Associate at the UBC Program on Water Governance; and Katie Paris is a sustainability consultant with Loop Initiatives in Ottawa. This report was produced by The University of Victoria's POLIS Project on Ecological Governance and LOOP Initiatives, in partnership with The Conference Board of Canada.

## EXECUTIVE SUMMARY

# Going With the Flow? Evolving Water Allocations and the Potential and Limits of Water Markets in Canada

### At a Glance

- ◆ Water scarcity is emerging as a challenge in some parts of Canada and will require new approaches to water management and governance.
- ◆ Canadian water allocations systems, including the Western provinces' first-in-time, first-in-right approach, are generally rigid and pay insufficient attention to ecosystem needs or changing priority uses.
- ◆ Market mechanisms, when situated in an appropriate institutional context, may help reallocate water to ecosystem protection and priority uses, but do not solve problems such as poor management, existing over-allocation, or failing water governance.
- ◆ Continued dialogue, increased understanding of policy options, and established ground rules should be minimum prerequisites to expanding the role of markets in Canadian water allocation regimes.

**W**ater scarcity increasingly affects the ways Canadians live, work, and play. In some of Canada's most populated areas and in key agricultural regions, limits to water use are becoming necessary. A changing climate will impact precipitation patterns affecting timing and availability of fresh water and will potentially increase regional water scarcity.

### WATER RIGHTS AND THE CANADIAN APPROACH TO ALLOCATIONS

Water rights can be viewed as a type of property right, which may, in some cases, convey rights of ownership and control. The right to transfer water is limited by the existing water laws and the type of water allocation regime in place. Water is fundamental to ecosystem processes; variable over time, space, and form; and centrally important to human life and the economy. These qualities make water, as property, a complicated issue, and its role as a tradable commodity is often severely contested.

Canadian water allocation regimes do not provide sufficient flexibility to cope effectively with increasing and persistent scarcity. In Canada's most water-scarce regions, prior allocation—or the first-in-time, first-in-right (FITFIR) principle—governs water allocations. Prior allocation locks into place past use patterns.

It does not protect ecosystem services or reflect interactions between ground and surface water. Prior allocation does not easily accommodate new users or uses, and is not flexible enough to address emerging challenges such as increased urbanization, new priorities, or climate change.

## WATER SCARCITY AND THE POTENTIAL OF MARKETS

Policy responses to emerging water challenges often include proposals to increase the use of market principles in water allocations. Putting a price on water creates incentives for conservation and efficiency of use, and eventually may result in reallocating water to higher value uses. However, the definition of “higher value” often differs between groups. Some may see higher value in ensuring enough water is allocated to fulfill ecosystem functions, while others would use the dollar value of proposed water uses as the sole measure of higher value. A well-designed market has the potential to reduce the role of regulators in the contentious and politically difficult role of reallocations. Individuals engage in transactions to accommodate new and changing priorities for water use. Finally, water managers—including government and broader civil society—benefit by using markets to maintain or enhance ecologically beneficial water flow under certain types of water trading regimes.

Water markets are not a panacea for the shortcomings of existing systems. They cannot compensate for poor management practices, nor solve problems of over-allocation, and may create incentives for further withdrawals in already stressed ecosystems. The impact of water markets on rural agricultural communities is not well understood. In addition, impacts on third parties are hard to predict and difficult to address when transactions change long-standing allocations. At a minimum, communities must have a role in ensuring adequate instream flow levels within the watersheds in which they are situated if water markets are to be successful.

## WATER MARKETS IN PRACTICE

Case studies of existing water trading systems demonstrate these tensions. (See Appendix B.) Alberta has implemented legal and regulatory changes enabling transfers of water allocations within the water-stressed South Saskatchewan River Basin. Evidence from this emerging water market is mixed: while transfers have mostly been within the agricultural sector, there have been some inter-sectoral trades that accommodate new users, including rural domestic users. Some of these trades rely on conservation improvements, effectively expanding supply. Other transactions exacerbate supply constraints when under-used allocations are traded to those who utilize the allocations more intensively, and in some cases, for commercial and recreational uses of debatable social value—such as casinos and racetracks.

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**Prior allocation of water does not easily accommodate new users or uses, and is not flexible enough to address emerging challenges such as increased urbanization, new priorities, or climate change.**

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Since the 1970s, California has implemented a series of reforms to incorporate water transfers in its multifaceted approach to water resource management. Water use is governed by prior appropriation and riparian rights, resulting in a complex legal framework. Water management planning authorities deal with surface and groundwater management and have the power to authorize transfers. California’s track record shows that transfers are largely from and within the agricultural sector. Crop idling is a major source of trades, and has created local backlash against trading, as fallowing creates economic losses in rural agricultural communities. Three principles have emerged to help govern Californian water trades:

- ◆ no injury to other users;
- ◆ no unreasonable effects to fish and wildlife; and
- ◆ minimization of local economic effects of transfers.

In the U.S. Pacific Northwest, a water transfer program has used market principles to increase instream flows in water-stressed streams. The Columbia Basin Water Transfer Program is a unique case: it benefits from an annual federal appropriation of US\$4.5 million to fund its operations and water purchases. Its mandate follows the strict requirements of the *Endangered Species Act* to restore the habitat of threatened and endangered species, and the *Northwest Power Act*, which requires mitigation for ecosystem damage created by the series of large hydroelectric projects in the Columbia River Basin. This program demonstrates that water markets can increase conservation and achieve higher instream flows under the right set of circumstances.

## THE PATH FORWARD

Before introducing more water markets in Canada, significant water governance reform is required. Basic ground rules for markets need to be established—including strong counterbalancing mechanisms to protect third parties, ecosystems, and the public good; and a significant commitment to, and resources for, basic water science and management and regulatory capacity, including monitoring and enforcement.

This report recommends the following steps for policy makers and stakeholders exploring the role of markets in water allocations:

- ◆ promote dialogue on the role of markets in water allocation and reallocation;
- ◆ increase understanding of policy alternatives;
- ◆ clarify trade law implications surrounding water rights marketing;
- ◆ establish clear ground rules; and
- ◆ proceed cautiously.





## CHAPTER 1

# Introduction—Water Markets as a Response to Water Scarcity

### Chapter Summary

- ◆ Water scarcity is becoming more prevalent in Canada.
- ◆ Trading allocated water rights is one policy tool to address scarcity. To date, Alberta is the only province or region using this tool in Canada.
- ◆ This report considers the benefits and limits of market-based transfers of water use rights for Canada.
- ◆ The analysis provides a broad overview for policy makers and decision makers. It includes theoretical and practical issues drawn from a literature review and case studies, and provides recommendations for further action.

*Our understanding of the factors driving change—the five ‘Ps’ (planet, people, past, politics, policies)—leads us to believe that the water challenge facing our world is potentially as serious as climate change.*

—B. Flowers, *Business and the World of Water*  
World Business Council on Sustainable Development

**W**ater is a critical issue that will affect virtually all sectors of society either directly or indirectly over the next few decades. Around the world, financial institutions, companies, and other organizations are assessing their water risks, and key among these risks is scarcity.<sup>1</sup>

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<sup>1</sup> To address the importance of this issue, the World Business Council on Sustainable Development (WBCSD) has launched a Water Project to engage a broad cross-section of the business community in critical water issues. See WBCSD, *Water and Sustainable Development*.

Canada, despite perceptions of water wealth and a firmly entrenched myth of abundance, is not immune to water scarcity, especially in densely populated and key agricultural regions of the country.<sup>2</sup> In addition to overuse and population pressures, degradation of water bodies is another potential cause of water scarcity. Droughts and changing weather patterns due to climate change will also increasingly affect supplies.

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**A sustainable water allocation system involves many competing priorities, including working within the ecological limits of availability; accounting for social equity needs; and maximizing economic productivity.**

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Greater use of markets to allocate water is one policy response to scarcity that is receiving more attention worldwide and in Canada. This report is an overview of some of the issues involved with using market principles to address water scarcity.

Evidence of formalized transferable water rights is beginning to emerge—primarily in Alberta. Yet the widespread introduction of similar systems across Canada is unlikely because of the nature of the water supplies in many regions and the historically based water laws that govern the resource across much of the country. Support for market solutions by some politicians, water managers, and policy experts also often outstrips general public support for this type of policy solution. This occurs despite evidence that a greater use of markets—when appropriately situated in a broad package of water reforms—has the potential to improve the share of water currently allocated to environmental needs.

Deciding who gets to use what share of water in times of scarcity is the job of water allocation systems (usually articulated through provincial water laws and regulations), which historically have not allowed licensed users to trade their allotted shares of the resource. Users—such as municipalities, irrigation districts, and larger industrial users—obtain rights to water through allocation

systems, which vary widely across Canada.<sup>3</sup> A critical aspect of the water challenge in Canada is to manage water allocations in a sustainable manner. A sustainable water allocation system involves many competing priorities, including working within the ecological limits of availability; accounting for social equity needs; and maximizing economic productivity, which includes fostering efficiency and allowing water to go to the most economically valuable purposes. As many governments across Canada are considering water governance, management, and allocation reforms, it is an opportune time to examine whether greater use of markets can complement existing (or proposed) allocation systems to address scarcity.

There are various options for obtaining more water or changing water from its existing allocated uses in times of scarcity:<sup>4</sup>

1. Expand supply through increased diversions or pumping of groundwater; expanded or new dams or other storage options; or through desalination (supply development).
2. Reuse and recycle industrial and municipal water and rainwater harvesting (multiple uses).
3. Increase water productivity through efficiency, wise use and conservation (demand management and the soft path).
4. Regulatory reform and government or public intervention (prioritization).
5. Reallocate water from current uses to new ones through water market and trading (water rights transfer).

This report addresses the final option: increasing the use of markets to facilitate water rights transfers. Integrating market principles is not necessarily a natural evolution of water allocation systems. It is one of many options and a deliberate policy choice with specific benefits, consequences, and responsibilities, all of which will be explored in this report.

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3 Water allocation rights are different from water access issues (such as municipal water services—the method by which the vast majority of Canadians, including many businesses, access water). This report focuses on allocated rights.

4 This list of options is adapted from Glennon, “Water Scarcity, Marketing and Privatization.”

## PURPOSE OF THE REPORT

This report reviews the potential benefits—and limits—of market-based transfers of the right to use water (often called water markets) into Canadian water allocation regimes to address water scarcity.

The information and discussion in this report are based on a review of the literature, an investigation of a variety of specific case examples, and a series of interviews with individuals working in the field, complemented by input from a selection of leading Canadian water experts from different disciplines and sectors.

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**This report's information and discussion are based on a literature review, an investigation of a variety of specific case examples, and a series of interviews.**

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## HOW THE REPORT IS ORGANIZED

This chapter introduces the topic, provides critical background, and lays out the purpose and focus of the report.

Chapter 2 reviews water rights in their broader context and outlines the range of governance reforms that should be considered before embarking on a system that emphasizes transferable water rights. It outlines how existing water allocation regimes in Canada can evolve to take a more ecosystem-based approach to address the challenges of scarcity and climate uncertainty.

Chapters 3 and 4 provide the core focus of the report. Chapter 3 explores the opportunities and drawbacks of using market mechanisms to achieve a more efficient,

equitable, and economically productive allocation of water that also protects ecosystem function. It also outlines some safeguards needed to ensure a robust system that can also protect the broader public interest. Practical experiences with water rights transfers both in Canada and abroad are reviewed in Chapter 4. This fourth chapter also introduces and discusses some of the ongoing debates associated with water markets.

Throughout these chapters, the analysis is guided by the following core questions:

- ◆ To what extent can integrating market principles into transfers of water rights and allocations help address the challenges of increased scarcity? What are the limits to their usefulness?
- ◆ In a market-based allocation system, how are ecosystems protected? Can market principles improve ecosystem services?<sup>5</sup>
- ◆ How does a market-based allocation system address basic human needs for water and questions of equity?
- ◆ What lessons have been learned elsewhere that would be applicable in informing Canadian law and policy reforms incorporating market principles in water allocation?

Chapter 5 summarizes the research and recommends a set of guidelines for moving forward. Finally, the appendices provide additional background materials including a bibliography, interview questions and key point summaries, and case studies from other jurisdictions.

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5 Ecosystem services are “the conditions and processes through which natural ecosystems, and the species that make them up, sustain and fulfill human life. These services include purification of air and water, mitigation of floods and droughts, detoxification and decomposition of wastes, generation and renewal of soil and soil fertility, and a host of other beneficial functions.” Dailey, “What are Ecosystem Services?” pp. 3–4.

## CHAPTER 2

# Water Rights and Allocations in Canada

### Chapter Summary

- ◆ Surface water rights in Canada vary across provinces and territories and are based on a variety of systems including: riparian rights, civil law, prior allocation, and authority management. Common law water rights have been modified significantly by statute.
- ◆ Existing water allocations and rights mechanisms were not designed with ecosystem protection or transfers in mind.
- ◆ Several mechanisms to reallocate or re-prioritize water uses exist, such as: involuntary sales, apportionment, litigation, negotiated multi-stakeholder agreements, agreements between rights holders, and markets.
- ◆ Water rights reforms must reflect broader governance considerations and are ideally situated in a broader strategy for long-term water security and sustainability.

*We have been quick to assume rights to use water but slow to recognize obligations to preserve and protect it . . . In short, we need a true water ethic—a guide to right conduct in the face of complex decisions about natural systems we do not and can not fully understand.*

—Sandra Postel, *Last Oasis*  
Director, Global Water Policy Project and the Center  
for the Environment, Mount Holyoke College

### WATER RIGHTS AND WHY THEY MATTER

**W**hen water is abundant, defining the water rights of those who share the same river, lake, or aquifer is relatively unimportant. However as populations grow, demand for water increases, especially in households, agriculture, and industry. Water scarcity—or perceived scarcity—is what ultimately prompts discussions of water rights reform and reallocation methods like water markets.

Quality of life is affected not only by physical access to water, but also by the degree of influence people have on decisions about water and its allocation.<sup>1</sup> Water rights and the coupled access and use of the resource mediate the human–environment interaction and directly impact ecosystem—especially aquatic and riparian—health. This in turn directly impacts community prosperity.

## DIFFERING CONCEPTIONS OF WATER RIGHTS AS PROPERTY RIGHTS

Water rights are a type of property right. Broadly defined, property rights are “the set of economic and social relations defining the position of each individual with respect to the utilization of scarce resources.”<sup>2</sup> As long as the resource is plentiful, little pressure to define or enforce those rights exists—however, as scarcity increases and competition intensifies, clarity becomes critical to defuse conflict.

Property rights are not just about “ownership” and the ability to do what one wants with property; a better frame of understanding is to think of property rights as divisible—as bundles of rights that different parties may hold.<sup>3</sup> These bundles can be separated into various categories including:

- ◆ the right to access and use the property (including withdrawal);
- ◆ the right to control other’s use of the property (including decision making to manage the resource and exclude others from it); and
- ◆ the right to alienate or transfer the right to the resource to others (including transfers and trades).

This type of bundling roughly aligns with three broad rights of use regimes and the associated institutions commonly seen in the water context:<sup>4</sup>

- ◆ **Public property (bureaucratic allocations)**—the state holds rights, usually with government agencies, through deferred authority, and directs who does and does not receive water in accordance with

bureaucratic (and political) policies and procedures (for example through licensing or permitting). This is the most common form of water rights regime used in Canada, with provincial bureaucracies administering licensing and permitting.

- ◆ **Common property (user based allocations)**—water users join together to coordinate their actions, managing water resources as a form of common property with collective decision making. This is common with cooperatives or irrigation districts, and in Canada, this model is usually nested in a broader public property based system.
- ◆ **Private property (market allocations)**—corresponds with the right of use being held by individuals, corporations, or organizations. Water is allocated and reallocated through private transactions, with owners trading water through short- or long-term agreements reallocating temporary and permanent rights in response to prices. This involves the creation of water markets and is increasingly common in parts of the U.S. and Australia.

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### Property rights are not just about “ownership” and the ability to do what one wants with property.

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It is important to note that these allocation institutions (and associated property types) are not mutually exclusive and can be combined in various ways at different locations and across different levels of water management. For example, all three types may be used within a given basin, with some groups of users making collective choices, while others (such as farmers) engage in transfers and agency administrators allocate water resources through licences and regulations.

The introduction of property rights to water, and the introduction of markets in such rights, is very complex and costly. It is not something to be undertaken lightly. For example, property rights need to be defined, identified, and registered; supply needs to be metered and monitored; and transfers of water rights need to be evaluated and approved.<sup>5</sup>

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1 Bruns, et al. (Eds.), *Water Rights Reform*.

2 Furubotn and Pejovich, “Property Rights and Economic Theory,” p. 1138.

3 Schlager and Ostrom, “Property Rights Regimes and Natural Resources.”

4 Bruns et al. (Eds.), *Water Rights Reform*.

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5 Bjornlund, *Water Scarcity and its Implications for Land Management*.

In this context, the public trust doctrine is an important concept. It asserts that certain resources are of too high a public value to be given over to private control, but should be held in trust by the state for the public good. As a general approach, it offers opportunities to uphold broader community values when considering the use of resources like water. (See box “The Public Trust Doctrine in the United States.”) It is most commonly asserted in the context of waterways to ensure that they remain usable for navigation, commerce, and fishing.<sup>6</sup> It is far more common in the U.S. than in Canada for a host of reasons beyond the scope of this report.<sup>7</sup> Nonetheless, the public trust concept has the potential to play a key role in water governance and management in Canada.

### The Public Trust Doctrine in the United States

U.S. courts have held that consumptive water rights are subject to the Public Trust Doctrine, and that water rights or regulatory approvals of withdrawals must also adhere to the doctrine where feasible. One of the most famous cases, and a leading precedent, is *National Audubon Society v. Superior Court of Alpine County*. In this 1983 Californian case, the court ordered the State Water Resources Control Board to review the 42-year old grant of Mono Lake waters to the City of Los Angeles. The review determined that water diversions should be reduced by two-thirds to decrease ongoing significant environmental damage and to maintain public trust values in Mono Lake.

## LEGAL AND REGULATORY FRAMEWORKS IN CANADA

Water allocation systems provide the rules and procedures for assigning rights and establish the processes used to decide how water should be shared among various users across industrial, agricultural, municipal, and domestic sectors. Ideally, allocation systems will also reserve water to sustain the environment. Effective, efficient, and equitable water allocation systems are critical to maintaining and enhancing environmental quality, economic productivity, and social well-being.<sup>8</sup>

6 Instream Flow Council, *Instream Flows for Riverine Resource Stewardship*.

7 See, e.g., Von Tigerstrom, “The Public Trust Doctrine in Canada;” Gage, “Public Rights;” and Kidd, “Keeping Public Resources in Public Hands.”

8 de Loe et al., *Water Allocations*.

Water allocation arrangements reflect differing historical, geographic, and cultural traditions and conditions. Water laws historically promoted settlement and agricultural and industrial expansion. Today, as water demands increase, water allocation arrangements are evolving to address the myriad pressures increasingly placed on water systems. These pressures are most acute in water-stressed areas such as southern Alberta, southern Saskatchewan, the Okanagan Basin in B.C., and limited parts of Ontario. The challenges include resolving tension among users with historically secure rights and protecting surface and groundwater water flows for the environment (traditionally not a water-rights holder).

A recent legislative review of provincial powers to enact water quality (not quantity) trading systems found that “most jurisdictions seem to have the means to initiate a trading program, through either a watershed management planning process, a nutrient management plan, or some other planning process.”<sup>9</sup> Further legislative reviews would be required to determine if legislative obstacles to the enactment of water quantity trading programs exist in any jurisdiction in Canada. (See box “Water Quality Trading.”)

### Water Quality Trading

A recent project by the Policy Research Institute examined the extent to which water quality trading (WQT) and variants of this policy instrument could be applied in the Canadian context. An important conclusion from this report was that “WQT will be a useful instrument in Canada only when local stakeholders and other relevant parties have decided to invest time and energy in making it work, and after they have collectively agreed that the tool offers potential benefits.”<sup>1</sup> In other words, it is possible to introduce water quality trading; no barriers are in the way, other than the not inconsiderable factors of political will and public acceptance.

1 Policy Research Initiative, *Can Water Quality Trading Help to Address Agricultural Sources of Pollution?* p. 33.

9 Policy Research Initiative, *Can Water Quality Trading Help to Address Agricultural Sources of Pollution?* p. 5.

## CURRENT APPROACHES TO WATER ALLOCATIONS IN CANADA

Canada's approach to water law in general, and water allocations in particular, varies significantly from province to province.

In Canada, the provinces have primary responsibility for the regulation of ground and surface water, with water generally owned and managed by the Crown.<sup>10</sup> Clear federal interests also exist in defining Aboriginal water rights, trans-boundary (including interprovincial) waters, waters on federal lands, and issues concerning navigation and fisheries.

Surface water rights in Canada are based on the English common law rule of riparian rights. This riparian system then evolved to address the range of differences in climate, geography, and development priorities across the nation and resulted in the development of distinct systems, including:

- ◆ **Regulated riparianism**—administrative licensing on top of the traditional court-made riparian doctrine. Under this system, direct water users (over a set volume) must have a permit to use water (up to an established limit) from an administrative agency. Ontario and some of the Atlantic provinces use this system.
- ◆ **Civil law tradition**—a hybrid system based on riparian rights and adapted from a civil law tradition. Quebec uses this system.
- ◆ **Prior allocation**—enshrines the FITFIR principle, where right to use is acquired upon allocation and requires the act of diverting water from its source and applying it to a “beneficial use.” B.C., Alberta, and Manitoba use this system.
- ◆ **Authority management approach**—where government delegates responsibility for allocation decisions to various regional or resource boards or bodies. The Yukon, Nunavut, and the Northwest Territories use this system.

10 For example, S 2 of British Columbia's *Water Act* contains the Crown ownership provision stating: “The property in and the right to the use and flow of all the water at any time in a stream in British Columbia are for all purposes vested in the government, except only in so far as private rights have been established under licences issued or approvals given under this or a former Act.” *Water Act*. R.S.B.C. 1996, c. 483, s. 2.

## GROUNDWATER—THE OFTEN FORGOTTEN RESOURCE

Groundwater rights evolved differently. In the English common law tradition, groundwater was treated more often as an exclusive right.<sup>11</sup>

English judges applying common law principles to water conflicts extended riparian rights to groundwater flowing in defined channels, while the rule of absolute capture applied to all other sources of groundwater: landowners could use water under their soil regardless of any injury caused to their neighbours. The law treated these two sources of water differently, despite their interconnectivity as part of the same hydrologic system, and led to significant fragmentation resulting in ineffective management and governance.

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### Surface water rights in Canada are based on the English common law rule of riparian rights.

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Evidence of this distinction is still apparent, as many water allocation systems in Canada do not adequately protect groundwater; for example, the province of B.C. is the only province that does not have a general licensing or permitting system for groundwater withdrawals, meaning that a well can be drilled without regulatory permission. Naturally, this creates significant challenges for any water allocation reform process.

Ground and surface water are part of the same resource.<sup>12</sup> Experts increasingly recommend integrated ground and surface water management.<sup>13</sup> Water scarcity may require managers to restrict or prohibit the issuance of new surface or groundwater licences. However, in areas where groundwater is not subject to a licensing system, water users may increase their rates of groundwater pumping, defeating the purpose of the surface water restrictions, and failing to solve the scarcity problem.

11 Providing liberty to extract, but not a right to prevent others from doing the same. See for example, *Acton v. Blundell* (1843) 12 M. & W. 324, and *Chasemore v. Richards* (1859) 7 H.L.C. 349, where groundwater law was based on the rule of capture (fundamentally a no-liability rule).

12 Winter et al., *Ground Water and Surface Water*.

13 Rosenberg International Forum on Water Policy, *Report on Water Policy to the Ministry of Environment*, p. 14.

## CONTEXT FOR WATER RIGHTS TRANSFERS IN CANADA

Except in a few areas where a certain stream reaches or groundwater aquifers are stressed, water is generally abundant enough that a potential new water user can almost automatically obtain government approval for the new use.<sup>14</sup> The only regions where widespread scarcity is a problem—a fundamental requirement for markets to function—are in the Prairies and parts of B.C. where prior allocation—the FITFIR principle—forms the legal framework.

Prior allocation<sup>15</sup> and the FITFIR principle ensure that the earliest granted licensee (the “senior” rights holder) is entitled to receive the entire amount stipulated in their licence before the next “junior” licensee can receive any water at all. Initially, regulators granted permanent water rights. More recently, rights are granted only for a limited time—usually long enough to protect the licensee’s investments.<sup>16</sup>

This model has become increasingly complex over the years, as specific amendments have been created in response to emerging concerns. However there are four features of the basic Western model that remain substantially unchanged in all Western jurisdictions:<sup>17</sup>

- ◆ the Crown retains ownership of water;
- ◆ the Crown distributes rights to water on a first-come, first-serve basis;
- ◆ water rights that were granted for an indefinite period are now being granted for a specific term; and
- ◆ competition between licensees for the available supply of water is governed in law, but not always in practice, by the principle of prior allocation.

14 For example, R. de Loe, a noted expert in water security, estimates that in the Canadian portion of the Great Lakes Basin, in most other river basins east of the Manitoba-Ontario border, and in the northern territories, current water withdrawals are less than 5 per cent of the renewable supply and consumptive use (excluding return flow) is generally less than 1 per cent. R. de Loe, personal communication with Oliver Brandes, May 9, 2008.

15 Prior allocation is the Canadian application of the “prior appropriation” concept used in the United States. It holds that the date of licence issue (not the date of the appropriation itself) establishes seniority.

16 Percy, *Water Rights Legislation*, p. 35.

17 Percy, “The Limits of Western Canadian Water Allocation Law.”

To free up water for new users, this system, in most cases, has been modified to recognize the relative importance of different uses. Statutory preferences list the main uses in priority order, usually listing domestic uses first, followed by municipal, industrial, irrigation, and finally, other uses. A new user who needs water for a higher purpose can apply to a designated official, usually an environment ministry civil servant, for the cancellation of an existing licence used for an inferior purpose.

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**Initially, regulators granted permanent water rights. More recently, rights are granted for a limited time—usually long enough to protect the licensee’s investments.**

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Although governments do have some discretion to reserve unallocated water for the public interest, this right has generally been exercised to make water rights available for large irrigation and hydroelectric projects and not ecosystem needs.<sup>18</sup> Problems with this system are most severe in areas where water shortages are common. In southern Alberta or B.C.’s interior, for example, some streams have been licensed beyond the volume of water that is actually available.

## LIMITS OF EXISTING SYSTEMS AND OPTIONS FOR REFORM

Decision makers continue to focus on tradeoffs between urban, agricultural, and industrial consumption when allocating water, often paying inadequate attention to ecosystem needs. (See box “Water Scarcity and Allocation Failures: A Recent Ontario Example.”)

In many cases, the administrative rules that guide these decisions share the same central defects of the common law systems—they do not promote the optimum use of water and are too rigid to adapt to changing societal priorities.

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18 Percy, *Water Rights Legislation*.



### Water Scarcity and Allocation Failures: A Recent Ontario Example

The Ontario approach to water permitting is an example of the riparian rights-statutory system.<sup>1</sup> This system evolved during a period when relative water demands were less significant and an understanding of the ecological processes of aquatic and riparian ecosystems was less sophisticated. Preservation of environmental values is dependent upon administrative policy and discretion. As the demand for water increases and the level of understanding of ecosystem function improves, the shortcomings of this system are more apparent.

For example, in the summer of 2000, Spencer Creek in southwestern Ontario “disappeared” temporarily because too much water was drawn from the local watershed. The Ministry of the Environment then restricted groundwater takings, and the creek reappeared. Recognizing the system’s inadequacy, the Ontario Minister of the Environment imposed a moratorium in December 2003 (that ran until the end of 2004) on all new and expanded water taking permits. Because of this, the Government of Ontario has amended the permitting system to apply more stringent criteria for managing water takings and has imposed new fees. It is relevant to note that these new rules do not apply to agriculture.

1 The Ontario Water Taking and Transfer Regulation (under the *Ontario Water Resources Act*) requires that a permit be obtained for withdrawals of over 50,000 litres per day. *Ontario Water Resources Act*. R.S.O. 1990, c. 0.40, s 34.3.

The FITFIR system prevalent in the West may no longer be adequate for dealing with the modern challenges of increasing demand and scarcity, especially in the context of climate change. Recent detailed analysis outlines a number of systemic weaknesses including:

- ◆ limited promotion of water conservation and efficiency;
- ◆ insufficient consideration of environmental and social equity factors in allocation decisions, and
- ◆ inflexibility in the face of uncertainty.<sup>19</sup>

Historically, Canadian water laws created water rights that were free, secure, indefinite, and not readily transferable—good for the purposes of the day, but ill suited to the modern challenges of water sustainability and long-term community prosperity.

Water allocation systems embody certain policy priorities; past objectives may no longer be current priorities, and so ultimately beg the questions: What are the water allocations systems for? What should they be trying to achieve?

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**It is preferable to take a holistic look at water allocation problems before delving into specific potential solutions such as water markets.**

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### A HOLISTIC APPROACH TO WATER GOVERNANCE AND MANAGEMENT REFORM

Water rights transfers are often proposed to address the limits of current allocation systems. The real question is: To what extent is broader water governance and management reform needed to address the question of over-allocation and reallocation of existing uses? Water rights transfers based on market principles are a specific type of possible reform, but represent only one option. It is preferable to take a holistic look at water allocation problems before delving into specific potential solutions such as water markets.

Rather than proposing water rights transfers as the solution to our water allocation problems, we should focus on improving water and environmental governance before eventually considering water rights transfers as one potential—but limited—tool for water use management.<sup>20</sup>

Scarcity is rapidly emerging as a major challenge for water management in some areas of Canada. Many options—including developing water markets—exist to deal with this challenge. (See box “Policy Options for Reallocating Water in Times of Scarcity.”) Ultimately, however, it is about how, and whom, society wants to make the decision to allocate water. Is it government—through legislated identified priorities or communities delegated by senior government and guided by key principles such as sustainability or specific principles, or is it markets and voluntary exchanges—based on perceived value associated with water?

19 For a more detailed discussion, see Brandes and Maas, “What We Govern;” and Nowlan, *Buried Treasure*.

20 Christensen and Linter, “Trading Our Common Heritage.”

## Policy Options for Reallocating Water in Times of Scarcity

**Administrative procedures:** Administrative procedures give decision makers the power to cancel or curtail all water rights. Most provincial water licensing schemes contain powers of this type.<sup>1</sup> Similarly, regulators often have the power to decline an application for licence renewal (if there is a fixed term in the licence). Another administrative power relates to licence amendments. Regulators can use these types of powers to achieve limited reallocation. In Alberta, the *Water Act* permits directors to withhold a 10 per cent conservation hold-back of a transferred volume under certain circumstances.

**Involuntary sales:** In a narrowly defined set of circumstances in Manitoba—where all the water available for use or diversion has already been allocated to other licensees or, in the opinion of water regulators, further allocation would negatively affect an aquatic ecosystem—the law allows the regulator to issue a water licence to a new applicant with a higher priority use as specified in the Act, and to buy the water rights of lower priority users. If voluntary negotiations for the sale fail, water regulators can require the parties to go to arbitration.<sup>2</sup>

**Equitable apportionment:** This allocation and reallocation method is commonly used in inter-jurisdictional settings. For example, in Canada, the governments of the four Prairie provinces entered into the Master Agreement on Apportionment<sup>3</sup> and established the Prairie Provinces Water Board<sup>4</sup> to ensure that interprovincial waters are protected and equitably apportioned in accordance with the Agreement. There are also apportionment obligations that arise under the Canada–U.S. Boundary Waters Treaty.

**Litigation:** Though not thought of as a method of reallocation, water rights litigation is commonly used in the U.S. to adjudicate complex and over-allocated systems, and often has the effect of reallocation by the courts.<sup>5</sup>

**Formal negotiated agreements through multi-stakeholder bodies:** In B.C., many of the more significant instances of reallocation have occurred through negotiated multi-stakeholder settlement as in the case of BC Hydro’s Water Use Plans (WUP), in which BC Hydro, the licensee, agreed voluntarily to reduce its water allocation at many hydroelectric facilities to provide more flows for fish. Other examples in B.C. have followed the WUP methodology to arrive at agreements for temporary reductions.<sup>6</sup>

**Informal negotiated agreements among licence holders:** Informal agreements—such as those that occurred in 2001 in Alberta where many licensees on tributaries of the Oldman River agreed, with the assistance of government facilitators, to a proportional sharing of their entitlements<sup>7</sup>—are also useful.

**Water rights transfers through markets:** Water markets, which allow allocated rights to be sold, leased, assigned, or donated, have started to be used in southern Alberta and are the topic of the remainder of this report.

1 For example, Section 23 of the B.C. *Water Act*, Suspension and Cancellation of Rights and Licences, lists a number of circumstances in which a licence can be cancelled or suspended related to failure to make beneficial use of the water, failure to pay water rentals, and failure to comply with the order of a water manager. *Water Act*. R.S.B.C. 1996, c. 483, s. 23.

2 *Manitoba Water Rights Act*, C.C.S.M. c. W80, s. 14.

3 Environment Canada, Master Agreement.

4 Environment Canada. Prairie Provinces Water Board Overview.

5 A majority of the western states are involved in general stream adjudications, which are complex and lengthy lawsuits to determine water rights. For instance, 27,000 persons have filed more than 77,000 claims to water rights in the Arizona general stream adjudication. In Idaho, more than 110,000 persons have filed 150,000 claims for water rights in the Snake River system. In Montana, approximately 80,000 persons have filed more than 200,000 water rights claims in the statewide adjudication. See *Dividing the Waters*, [www.dividingthewaters.org/about/index.php](http://www.dividingthewaters.org/about/index.php).

6 Nowlan and Bakker, *Delegating Water Governance*.

7 Bankes, “Legal Framework.”

Recent research recommends comprehensive water governance reform, with water allocation as an important component of a broader strategy to develop water security and sustainability in Canada.<sup>21</sup> The modern view of water allocation requires allocating shares in the resource so that all users, including the environment, have an adequate share without making any one group worse off, both now and in the future.

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**As water scarcities increase, the role of water in providing ecosystem services gains prominence, and conflicts over water use intensify.**

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Climate change will likely bring increased variability and long-term change to precipitation patterns, and consequently, adaptability and resilience will need to be built into water governance—and allocation—regimes. (See box “An Ecosystem-Based Approach to Water Allocations” for an overview of some broad directions that should inform future reforms in Canada.)

Recent major reports examine potential large-scale water reforms in Canada,<sup>22</sup> and any discussion of water markets or other allocation reforms should not be divorced from this broader perspective to ensure appropriate public policy outcomes. The diversity of cultures, environments, economic activities, and other conditions means that there is no one best way to improve water rights and water allocation institutions. In short, context matters.

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21 Bakker (Ed.), *Eau Canada*; Pollution Probe, “New Approach to Water Management;” Morris et al., *Changing the Flow*; Sandford, *Water, Weather*; and Banks and Cochrane, *Water in the West*.

22 The ambit and character of the water governance and management reforms needed are beyond the scope of this paper. However, the following provide a good starting point: Bakker (Ed.), *Eau Canada*; Brandes et al., *At a Watershed*; de Loe et al., *Water Allocations*; Morris et al., *Changing the Flow*; and Nowlan, *Buried Treasure*.

### **An Ecosystem-Based Approach to Water Allocations**

Water law and policy are currently in a state of transition. As scarcities increase, the role of water in providing ecosystem services gains prominence, and conflicts over water use intensify.

Any significant water governance reform must shift from the historical approach that emphasized freshwater withdrawals for economic development and large-scale modifications of aquatic systems through dams, reservoirs, and diversions to an ecosystem-based management (ESBM) approach that recognizes the ecological limits on the amount of water that can be safely removed from watersheds (and the relative uncertainty associated).

Historically, fixed allocations were regarded as key to water security and economic stability for industries and organizations that relied on stable property rights. However, increasing demands on water and emerging hydrological understanding show the limitations of water allocations issued in perpetuity. These types of allocations create inflexible arrangements that cannot adapt to changing circumstances and result in over-withdrawals that degrade the existing natural capital and may undermine ecosystem function.

At its core, such ESBM approaches require “cap” or “sustainability boundaries” (or buffers) on water withdrawals to protect key physical, biological, and chemical processes in aquatic systems that reflect the dynamics and uncertainty of complex social-ecological systems.

Caps must be adjustable and flexible enough (based, for example, on proportions as a percentage of the whole instead of on absolute volumes) to respond to changing conditions and new information (such as impacts associated with climate change). The overt goal of ESBM is to withdraw water for human use only in patterns that emulate natural fluctuations in levels and flows.

Using such an approach clearly nests the human water economy within the finite natural water economy. Once ecological water needs have been identified, they require legal and institutional protection. This approach is increasingly common internationally, especially in regions where scarcity and human-environmental interactions are particularly acute, such as in Australia, Europe, and South Africa.<sup>1</sup>

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1 For recent explorations of this topic, see Brandes et al., “Water Allocations;” Brandes and Maas, “What We Govern;” and Postel and Richter, *Rivers for Life*.

## CHAPTER 3

# Dealing With Scarcity Through Water Rights Transfers and Markets

### Chapter Summary

- ◆ Markets always operate in a regulatory system and are not a substitute for regulations.
- ◆ While markets may be effective at reallocating water between some uses, they must be part of a larger integrated water resource management strategy that emphasizes ecosystem and social considerations.
- ◆ Regulators must retain several key oversight and management functions including defining water rights; determining circumstances in which transfers are appropriate; protecting ecosystem health; approving transactions; protecting third parties; and oversight, monitoring, and enforcement.
- ◆ Good water governance practices are a prerequisite to effective water rights transfer systems.

*The water market can be a very good servant to move water around between competing uses and drive the process towards sustainable rural communities, but if left to its own forces, it could prove a very unforgiving master.*

—Dr. Henning Bjornlund, “Formal and Informal Water Markets”

Canada Research Chair in Water and the Economy,  
University of Lethbridge

### A MARKET-BASED APPROACH

Using markets to transfer water rights is a potential option for dealing with scarcity. Some of the motivations for moving to a market-based approach in Canada include:

- ◆ recognition of markets as an effective mechanism for efficiently allocating scarce resources and as a flexible problem-solving tool that promotes innovation;
- ◆ increasing acceptance of economic instruments in environmental management and public policy, such as the sulfur dioxide (SO<sub>2</sub>) “cap-and-trade” system which reduced acid rain in the northeastern United States;

- ♦ the move in other jurisdictions with roughly similar legal and institutional structures—such as Australia and the western U.S.—to greater use of water markets to address scarcity;
- ♦ political motivations to remove regulators from the role of imposing reallocations, and to shield politicians from the results of bureaucratic restrictions; and
- ♦ increasing problems in communities and watersheds facing long-term water scarcity—especially in the dry Prairie and Western provinces of Canada—with over-allocation of water and inflexible existing allocation systems.

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**The actual water limit (or the minimum to be left in an ecosystem) must be established through instream flow analysis, hydrological sciences, and, most critically, transparent democratic processes.**

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Chapter 2 emphasized that effective resource allocation reform requires establishing the limits of human water use. Establishing this limit is a critical *social* decision, not a decision that should be left to market resolution. The actual water limit (or the minimum to be left in an ecosystem) must be established through instream flow analysis, hydrological sciences, and, most critically, transparent democratic processes. When these preconditions have been met, then other tools—such as markets—can be deployed to maximize social benefits from the water available in excess of the environmental requirements. (See box “Is Water Really a Commodity?”)

Water markets are one of many options to reallocate water and to deal with over-allocated systems. As with any natural resource management approach—and especially given water’s critical importance for economic prosperity, ecosystem function, and basic human needs—the “devil is in the details” as many forms, permutations, and applications of markets exist.

Formal markets are best suited to trades that go beyond the local community, trades that are not just temporary, and trades that occur between (rather than within) sectors

with more far-reaching third-party effects. Informal markets may be most likely to develop within geographically confined areas and among community members, and perhaps between members of water use associations.<sup>1</sup>

### THE BROADER POLICY CONTEXT

While markets may be effective at moving water around between different uses,<sup>2</sup> they must be carefully phased-in as part of a larger integrated water resource management strategy, which has considered the political and

#### Is Water Really a Commodity?

The characteristics of water distinguish it from other resources. Above all, it is essential to life and has no substitute. It is fluid rather than fixed—both spatially (on the landscape) and in form (vapor, liquid, snow, or ice). The supply of water is uncertain. This uncertainty will only grow as the impacts of climate change accumulate. Water can supply many users at the same time. Its unique properties of fluidity and reuse make water markets radically different and much more complex than land markets. As eminent U.S. water law expert, Joseph Sax, notes: “Unlike almost every other form of property, which we allow to be fully privatized, water has always been viewed as something in which the community has a stake and which no one can fully own. The complexity of this point is usually embraced in the phrase ‘third-party effects’ when talking about water transfers.”<sup>1</sup>

Many debates centre on whether water is a right or commodity. A potentially far more helpful framework for the management of water resources is to consider a continuum, with water as a right at one end and a commodity at the other. Some uses—such as for drinking or sanitation—clearly fall in the category of water as a right, while others—such as water for agriculture, industry or swimming pools—fall toward the commodity end of the spectrum. When considering the role of market principles in guiding decisions related to water reallocations, these characteristics should help determine which aspects of water management are potentially best governed by market principles.

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1 Sax, “Understanding Transfers,” p. 37.

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1 Bankes, “The Legal Framework.”

2 Bjornlund, “Formal and Informal Water Markets.”

institutional implications of changing or establishing water property rights.<sup>3</sup> Care must be taken to ensure that markets “are not a substitute for a broader legal or regulatory mandate to designate flows for the health and functioning of freshwater ecosystems.”<sup>4</sup>

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**In Canada, few provinces have produced a comprehensive water strategy that includes water markets.**

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Other regions such as Australia, South Africa, and the European Union (EU) use market-based instruments as part of a larger policy. For example, the European Commission, in response to concerns about more frequent droughts, recently conducted an in-depth assessment of water scarcity, and canvassed the European states on the key players and causes; the economic, social, and environmental impacts; water pricing policies; and states’ expectations on the role the EU Water Framework Directive could play in alleviating scarcity.<sup>5</sup>

In Australia, the Council of Australian Governments (COAG) separated water entitlements from the property right in land and launched complementing financial incentives to promote trading in water entitlements in 1994 as part of a much broader water framework. This COAG initiative is ongoing and includes specific attention to institutional reforms, consultation and public education, and environmental considerations that specifically acknowledged it as a legitimate user of water.<sup>6</sup>

In Canada, few provinces have produced a comprehensive water strategy that includes water markets. Alberta is the exception. It is the sole province with a formalized market transfer system, which was introduced at the same time as significant overall reforms to the two main provincial water laws, the *Alberta Water Act* and the *Irrigation Districts Act*, and the roll-out of the Water for Life strategy. (See Chapter 4 and Appendix B for further discussion of the Alberta experience.)

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3 Bauer, *Siren’s Song*.

4 Postel and Richter, *Rivers for Life*, p. 117.

5 Water Policy in the European Union, “Communication on Water Scarcity and Droughts.”

6 Council of Australian Governments, “Communiqué;” Bjornlund, *Water Scarcity*.

## HOW WATER MARKETS FUNCTION

A water transfer can be defined in different ways. The *California Water Code* defines a water transfer as a temporary or long-term change in the point of diversion, place of use, or purpose of use due to a transfer or exchange of water rights.<sup>7</sup> The National Research Council defines a water transfer as any change in the point of, or a change in the type or location of use.<sup>8</sup> In the Canadian context, “a transfer is a formal arrangement subject to governmental review and approval by which a person (the transferee) may acquire all or part of the water right of a licensee either absolutely or for a term.”<sup>9</sup>

These definitions demonstrate the wide ambit of possibilities. A transfer from one farmer to a neighbour within the same watershed is relatively straightforward. More complicated transfers might include transactions across districts or even across basins, or between two different types of users. A variety of aspects of the right to access or use the water can also be traded. Permanent transfers of water rights are possible, but so are temporary options, such as leases or future options without exchange of ownership.<sup>10</sup>

### BASIC MARKET REQUIREMENTS

Three basic elements must be present for markets to function:

1. Water scarcity—without scarcity there is no “value” in trading as more water can simply be acquired through licensing (or drilling for unlicensed groundwater).
2. The ability to separate water rights from land rights to enable trade of the water alone.
3. Institutional infrastructure—including clear enforceable property rights, registries and venues of exchange, accessible information about the resource and existing rights, dispute resolution mechanisms, ground rules of operation, and ongoing monitoring and enforcement.

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7 California Water Code, Section 1728, temporary water transfers; Section 1735, long-term water transfers.

8 National Resource Council, *Water Transfers*.

9 Bankes, “Legal Framework,” p. 25–26.

10 Brewer et al., “Transferring Water,” p. 1021.

## WHAT IS TRANSFERRED?

The markets used to transfer water rights can take many forms. Transfers can range from water right sales involving the permanent transfer of a water right, to temporary water leases where the right to use a certain volume of actual water, or the right to abstract or use water in the future, is transferred for a period of time, but the longer-term right to the water remains with the original owner. Actual volumes or shares of a consumptive pool are also possible.

However, in general there are two primary types of markets:

1. Entitlement market—which involves the trading of long-term entitlements to receive seasonal allocations.
2. Allocation market—which involves the trading of short-term rights to use a volume of water allocation.

Drawing a parallel to the property market, the entitlement market is the market in which real estate is bought and sold, while the allocation market is the one in which real estate is leased or rented.<sup>11</sup>

## ADMINISTRATION

Water markets may be administered by a variety of bodies, such as by water exchanges, water authorities, water brokers and other intermediaries, or simply by private dealings between individual entitlement (licence) holders like a water bank, water trust, or a government agency. In some cases, water banks purchase water for instream purposes and do not act as administrators. (For additional details on how various water markets actually function, see the case studies in Appendix B.)

## WHAT IS THE VALUE OF WATER?

The introduction of market principles into water allocations begs the question of how much water is worth. The value placed on water depends on a multitude of factors. Timing of use matters enormously: During droughts or late summer low-flow periods, water is

worth much more than in times of abundance. The value of the end use of water, the existence of conveyance or storage facilities, the relationship of buyer and seller, and the existence of alternative sources all play major roles in pricing water, and these factors will help set a price acceptable to buyer and seller.

One key policy question in considering whether to integrate greater use of market principles is whether pricing may end up excluding certain users from access to water, and whether mechanisms are in place to create a transparent, functioning marketplace that includes all buyers and sellers.

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**The introduction of market principles into water allocations begs the question of how much water is worth. The value placed on water depends on a multitude of factors.**

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Examples from existing markets show that water values vary widely and that significant increases can be expected as markets establish themselves. The Australian literature indicates that prices of water trades fluctuate widely both within and between seasons in response to changes in the level of water scarcity (measured by the seasonal allocation level as well as localized fluctuations in rainfall and evaporation).<sup>12</sup> Prices in both the allocation and the entitlement market have also increased considerably over time with an annual growth of 20.2 per cent and 12.3 per cent respectively. Prices first reached US\$500 per 1000m<sup>3</sup> in 2002–03 and climbed to US\$1000 in 2006–07, far exceeding what can be financially justified for most agricultural productions.<sup>13</sup>

In Alberta, a recent study showed that prices vary significantly from trade to trade. Among permanent transfers of water rights in the first five years of trading, the price varied from C\$140/dam<sup>3</sup> to C\$740/dam<sup>3</sup>.<sup>14</sup> Subsequent to that study, up to C\$6,000/dam<sup>3</sup> was paid.<sup>15</sup>

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11 Bjornlund, *Water Scarcity*.

12 Bjornlund, *Water Scarcity*.

13 Ibid., p. 17; Bjornlund, "Water Markets."

14 Nicol et al., "Case Study."

15 D'Aliesio, "Putting a Price on Water."

While practitioners interviewed for this report did not express specific concerns regarding variability in prices, they recognized that the marketplace may be imperfect and recommended several measures that may be taken to help remedy the variability in the marketplace:<sup>16</sup>

1. Create a forum or marketplace where buyers and sellers may find each other. This could be a website, and could be as simple as just a clearinghouse rather than an institutional forum for executing trades.
2. Increase the transparency of transactions by making detailed information about past trades public to create greater awareness of water values and a sense of fairness to other market participants.
3. Explore different forms of auctions (as is more commonly done in Australia).

### HOW IS PRICING REVEALED IN SINGLE-BUYER MARKETS?

A dilemma arises when single buyers such as government agencies participate in market transactions: How does a non-profit or public agency arrive at a fair price to offer? Given the experience of water trusts in the U.S., several methods may be used to establish a fair price:

1. Conduct appraisals of land with and without water rights (according to stringent federal appraisal guidelines) to determine comparable sale prices.
2. Conduct farm crop budget analyses, analyzing the costs and proceeds of certain crops, to arrive at an estimate of the additional value created by water.
3. Determine comparables, or sales comparisons, to other water trades in areas where such comparables exist.<sup>17</sup>

Ultimately, these prices should reflect market value, or sellers will not agree to trades. According to Henning Bjornlund, the challenge is to ensure that transactions benefiting the environment do not overly distort the market. This could be facilitated by measures such as tax deductions for water given as gifts or exempting such transfers from capital gains tax.<sup>18</sup> Other options

include paying sellers an amount in excess of market price to provide ecosystem services as part of a deal; eliciting a commitment to stay on the land and within the community; or providing payment over an extended period to secure the selling farmer a steady income stream rather than a lump sum.

## GOVERNMENT AND THE REGULATORY ROLE

In a perfectly competitive market, willing buyers and sellers meet to exchange water or water rights with a price that reflects all the values put on water. Under these ideal conditions, water markets would ensure that the right to access and use water goes to those who value it the most, and would consequently go to the highest value uses—with little or no impact on others. If water was a standard commodity, free-market allocation of resources would be efficient and there would be few policy or regulatory concerns.<sup>19</sup> However, this only happens in textbooks and theory.

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**Practitioners interviewed for this report did not express specific concerns regarding price variability, but they recognized that the marketplace may be imperfect and recommended several measures that may be taken.**

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Implementing markets could, in principle, reduce state intervention—in particular to determine who can access water. However, the state still has to intervene, for example, to determine the total amount of water that can be traded, or to organize trading to ensure environmental or other social goals are met. “The implementation of markets may, in fact, be better described as transforming the regulatory functions of the state.”<sup>20</sup> In fact, the “required degree of public intervention might be so large that the resulting arrangements hardly qualify as a market at all and, in fact, could better be viewed as an enhanced form of public management.”<sup>21</sup>

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16 F.A. Ross, interview, April 15, 2008; D. McGee, interview, April 10, 2008; and T. Payment, interview, April 16, 2008.

17 A. Purkey, interview, April 23, 2008.

18 H. Bjornlund, personal communication with Oliver Brandes, May 9, 2008.

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19 Chong and Sunding, “Water Markets and Trading,” p. 242.

20 Policy Research Initiative, *Market-Based Instruments*, p. 4.

21 Dellapenna, “Markets for Water,” p. 35.



The government's role does not diminish significantly in a well-organized water trading system, except to the extent that the regulator does not make the actual reallocation decisions—buyers and sellers do. An Alberta regulator noted in his interview: “Inventiveness and fine tuning comes from people on the landscape.”<sup>22</sup>

### **SIGNIFICANT ROLES FOR REGULATORS IN WATER MARKETS**

Practitioners interviewed for this report noted several significant roles for regulators in creating the organizing framework in which market principles may function, including:

- ◆ defining water rights;
- ◆ deciding under what circumstances licensed water uses may be changed;
- ◆ determining minimum water levels or instream flows for ecosystem health;
- ◆ reserving the right to approve or deny individual trades;
- ◆ protecting third party interests; and
- ◆ providing oversight, monitoring, and enforcement.<sup>23</sup>

There is a strong argument that allowing water rights transfers to proceed with little or no government oversight will undermine the confidence in the market itself. The first large-scale water transfer ever in the American West was the sale of water rights from the Owens Valley to the City of Los Angeles. In this case, the City bought Owens Valley farms, to which the water rights were attached. It is generally accepted that the City's heavy-handed tactics significantly undermined water markets in California.<sup>24</sup>

## **WATER RIGHTS TRANSFERS—BENEFITS, RISKS, AND SAFEGUARDS**

Table 1 summarizes some of the benefits, risks, and limitations associated with using markets for water rights transfers. The complexity of trying to balance these benefits with the risks is exactly what makes decisions about pursuing water markets—or not—so difficult. Table 1 also proposes some safeguards to ensure that markets do not exacerbate existing problems or create a host of unintended (and potentially harmful) consequences, but instead play a beneficial role in achieving environmental and social objectives.

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**The government's role does not diminish significantly in a well-organized water trading system, except to the extent that the regulator does not make the actual reallocation decisions—buyers and sellers do.**

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As with other water reforms, introducing water markets requires “good” water governance—careful and transparent planning and management, measurement and enforcement of water use and rights, appropriate dispute resolution, integrated watershed-based ecosystem management, and public participation in decision making and regulatory oversight.

22 D. McGee, interview, April 10, 2008.

23 A. Purkey, interview, April 23, 2008; D. McGee, interview, April 10, 2008; P. Yolles, interview, April 14, 2008; and F.A. Ross, interview, April 15, 2008.

24 Libecap, “Chinatown.”

**Table 1**  
Using Markets for Water Rights Transfers: An Overview of Potential Benefits, Risk, and Safeguards

<b>Allocation issue</b>	<b>Potential benefits</b>	<b>Potential risks and limitations</b>	<b>Basic safeguards</b>
<b>Responsiveness to changing conditions and demands</b>	<p><b>Markets improve flexibility and resiliency of existing allocation systems</b> by providing signals that can facilitate adaptation to changing seasonal, economic, social, and environmental conditions or unexpected circumstances.</p> <p>Markets can facilitate new high-value users in water-constrained systems.</p>	<p>Once markets are created, it is very difficult to undo or withdraw rights associated with the ability to transfer rights without significant compensation and therefore markets may pose a risk of de facto privatization of water resources, in which private benefits trump socially optimal uses.</p> <p>Inadequate information, purchasing power imbalances between water users, insufficient buyers or sellers, and social and environmental externalities may cause markets to fail.</p> <p>Markets may generate high transaction costs, including costs of negotiating trades, providing information, and physically conveying transferred water.</p>	<p>Markets are only one option of many and require careful consideration and significant attention to institutional design and governance.</p> <p>Consider using only in areas with existing prior allocation systems and with appropriate institutional infrastructure to ensure protection of the public good, including:</p> <ul style="list-style-type: none"> <li>◆ definition of property rights/entitlements;</li> <li>◆ low transaction costs;</li> <li>◆ full transparency;</li> <li>◆ public participation;</li> <li>◆ competition;</li> <li>◆ no significant power imbalances (including monopolization protections);</li> <li>◆ detailed water use monitoring; and</li> <li>◆ provisions to ensure compliance with the conditions of the transfers.</li> </ul> <p>Develop markets only as part of broader water governance reform that emphasizes an ecosystem-based management (ESBM) approach.</p>
<b>Water conservation</b>	<p><b>Markets provide incentives for water efficiency and stimulate innovation</b> through new technologies or practices to save water.</p>	<p>The environmental effects of trading may be difficult to predict with unintended consequences, including:</p> <ul style="list-style-type: none"> <li>◆ reduced return flows (due to an increase in consumption by the transferee), leaving less water in the stream for other appropriators;</li> <li>◆ changes in timing of diversions to a high-demand period and changes in the total amount of water diverted due to transfers of seasonal rights; and</li> <li>◆ degradation of water quality.</li> </ul> <p>“Sleeper” or “dozer” rights—rights that have not been fully used—may become activated increasing the intensity of use once traded.</p>	<p>Establish “a priori” ecological limits on withdrawals that account for basic instream flow needs (IFNs) with a precautionary buffer, thus setting a cap on, or the bounds within which, trades can occur. These pre-established limits must be set in law to ensure enforceability.</p> <p>Mandate detailed publicly accountable watershed planning that establishes ecological limits within which the trading system is to be situated and requires water use plans proving best management practices.</p> <p>Separate consumptive uses from withdrawal uses (with return flows) and limit trades to historical use (not licensed use).</p> <p>Trade in shares (per cent of consumptive pool) instead of volumes (actual litres), thus increasing flexibility to address fluctuations in water availability from year to year.</p>

(cont'd on next page)

**Table 1 (cont'd)**  
Using Markets for Water Rights Transfers: An Overview of Potential Benefits, Risk, and Safeguards

<b>Allocation issue</b>	<b>Potential benefits</b>	<b>Potential risks and limitations</b>	<b>Basic safeguards</b>
<b>Economic productivity</b>	<b>Markets increase economic productivity</b> as water moves from low- to high-value uses, and may provide a new opportunity for agriculture to diversify income streams by trading water.	The cumulative impact of multiple transfers out of less productive agricultural regions may trigger economic crises in those communities and irrigation districts, and may compromise soil integrity. Shifting water out of supply systems may increase operation and maintenance costs for remaining irrigators. Opportunity costs may lead to the substitution of less regulated sources (such as groundwater) for tradable surface rights, exacerbating existing concerns about over-reliance on groundwater.	Establish regulatory oversight and approval system with clear criteria, including: ◆ a mechanism for “no harm analysis” prior to approval for transfer; ◆ formal procedures for considering the impact of trades on third parties (e.g., downstream users) and, where appropriate, arranging compensation; and ◆ access to adequate information (e.g., posting of trades and prices), public participation rights, and access to justice mechanisms. Set spatial (i.e., watershed) restrictions to trade. Provide adjustment assistance to affected communities.
<b>Allocation decision making</b>	<b>Markets use a voluntary process</b> that relies on willing buyers and sellers. They take regulators out of the reallocation decision-making process and thus potentially depoliticize scarcity decisions.	Market outcomes may not reflect social and environmental priorities (e.g., shifting water out of agriculture into non-essential uses such as golf courses and casinos, or degrading natural capital for short-term economic gain). Markets offer inadequate protection for traditional unregistered users, such as Aboriginal communities and the environment. Markets may result in speculation and market concentration (water barons).	Fully integrate water allocation system to account for ground-surface water connections and link quality concerns (such as source and waste water). Provide clear, enforceable, and transferable property rights. Set up clear and low-cost dispute resolution mechanisms—something beyond current courts or processes with restrictive standing requirements. Place limits on ownership.
<b>Market participation by conservation buyers</b>	<b>Markets may provide new opportunities for conservation</b> by potentially allowing third parties (such as governments or conservation groups) to enter into a water market specifically for conservation purposes, especially in closed systems.	Markets require extra financial contribution from third parties (or taxpayers) to protect public resources that should not be over-allocated in the first place.	Ensure full access to the market so that conservation groups and governments can participate as buyers in market. Provide long-term protection for water acquired for conservation purposes.

Source: The Conference Board of Canada.

## CHAPTER 4

# Water Markets in Practice and Ongoing Debate

### Chapter Summary

- ◆ Water markets in some cases have reallocated water and promoted water efficiency when complemented by appropriate ground rules and situated in a broader institutional context.
- ◆ Negative third-party impacts and uncertainties concerning incorporation of instream flow needs require further analysis and research.
- ◆ The mixed results to date in Alberta and British Columbia suggest that caution and a thorough assessment of the economic and environmental impacts are needed when implementing market mechanisms.

*Countries and governments should not make the mistake of thinking that they can implement reforms in two steps, by first adopting a free-market approach to water economics as a straightforward initial step, and then turning their attention to the remaining problems of the IWRM and water governance. At that later point, their hands will already be tied by a definition of property rights that has major political and institutional implications.*

—C.J. Bauer, *Siren's Song*  
Associate Director, The University of Arizona Water  
Resources Research Centre

## INTERNATIONAL EXPERIENCES

Water markets have had mixed results. At their best, markets have been an efficient way to achieve a balance between supply and demand, stimulate innovation, and promote water efficiency. Yet, markets have also caused problems for the environment and for less powerful members of society.

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**At their best, water markets have been an efficient way to achieve a balance between supply and demand, stimulate innovation, and promote water efficiency.**

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In the western U.S., the use of water markets is increasing. While markets are used more frequently to protect instream flow needs (IFNs), concerns about the third-party effects of transfers, impacts on agriculture, and the need to monitor the impacts of trades on water quantity and quality persist. Between 1998 and 2005, instream flow transactions occurred in all western states except Wyoming, and more than 1,000 transactions occurred in Montana, Oregon, and Washington.<sup>1</sup> In California, environmental transactions are increasing overall and transfers play a key part in purchases by federal and state agencies for environmental purposes.<sup>2</sup> In California, the economic benefits of water trading have been documented in cases where the agricultural seller uses the proceeds to reinvest in farming, or where the water district or regional water agency seller reduces water rates or improves facilities. A recent update to the California Water Plan gives examples of cases where these types of benefits have accrued—such as the Western Canal Water District, which used the proceeds from drought water bank sales to remove diversion dams and reconfigure canals to reduce impacts on threatened spring-run salmon, and the Yuba County Water Agency that used over \$10 million from the proceeds of water transfers to fund flood control projects.<sup>3</sup> California's water laws and market experiences are complex. The state agency

responsible for the Water Plan identifies the major challenges associated with water transfers as: maintaining agricultural productivity; balancing competing interests in water; and ensuring that the cumulative environmental impacts of transfers are assessed.<sup>4</sup> (See Appendix B for a case study of California water markets.)

The Australian experience has also been mixed, with some benefits and some concerns. Water trading has been largely among irrigators, especially in the Murray-Darling Basin region. Evidence shows that markets facilitated the reallocation of water (with the associated socio-economic benefits), but also that rural communities declined as a result of drought and policy-induced scarcity.<sup>5</sup> An Australian National Water Commission report found that selling off water helped some dairy farmers avoid foreclosure during the drought, but also confirmed that permanent water trading was encouraging other farmers to leave the land. The report also found that it was difficult to separate the effects of water trading from the effects of the long-lasting Australian drought.<sup>6</sup>

Water market experiments in Chile and South Africa have been even less successful, exacerbating social inequity. A case study in one Chilean province showed that the peasants' share of water rights decreased significantly as time went on, both in aggregate and per capita terms, undermining their agricultural production potential and leading to a deterioration in their standard of living.<sup>7</sup>

In the more successful examples, strong water governance practices and principles were already in place. For example, in Australia the move to water markets was part of a significant and extensive series of reforms underpinned by a serious government commitment to providing sufficient resources and ensuring environmental protection.<sup>8</sup>

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1 Scarborough and Lund, *Saving Our Streams*.

2 Brewer et al., "Law and the New Institutional Economics."

3 See, for example, California Department of Water Resources, *California Water Plan Initial Update 2009*.

4 Ibid.

5 Bjornlund, "Water Markets."

6 Rural Industries Research and Development Corporation, *Impacts of Water Trading in the Victorian Murray Valley*.

7 Romano and Leporati, *The Distributive Impact of the Water Market in Chile*.

8 Haisman, "Impacts of Water Rights Reform in Australia."

## CANADIAN EXPERIENCES

In Canada, regulators use a variety of tools to address over-allocation and reallocation of water. Reallocation to address scarcity is already occurring, whether formally or informally, in many of the Western provinces of Canada. To date, only Alberta has embarked on a market and trading system for water rights. A brief description of Alberta's experiences with a water trading system is set out below, followed by a description of recent experiences in B.C. and Ontario.

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### There are several ways in which Alberta's *Water Act* was intended to ensure ecosystem protections.

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#### ALBERTA

In 1999, Alberta passed the *Water Act*, which instituted a system that permitted transfers of water allocations under a licence and permanent sales of water rights. The primary change introduced by the *Water Act* was the ability to sever the licensed allocation from the land to which it was linked. The Act also authorized the assignment of priority—the date attached to the original allocation of the water—to transferees. Water allocations in good standing would be allowed to be traded within basins, within the context of basin-wide water management plans, and with government approval either permanently or for a fixed term.<sup>9</sup> (See Appendix B for a case study of Alberta's experience.)

#### Instream Flow Needs and Water Conservation Objectives

There are several ways in which the *Water Act* was intended to ensure ecosystem protections. First, it authorizes (and the province has provided some minimal funding) local water management plans. Either an approved water management plan or cabinet approval is

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9 It is worth noting that while this formal provision exists, in practice the older *Irrigation Districts Act* may be a more significant source of reallocation as it is the framework for trading within and potentially even among irrigation districts.

required before a transfer will be considered.<sup>10</sup> Within the context of these plans, a given river's instream flow need (IFN) is identified. The IFN is the amount of water needed to maintain the river's ecology, and is intended to be based on scientific evidence. The process of setting the IFN has proven to be controversial as it calls into question what the natural flow level actually is, and what kind of ecosystem the flow is intended to foster, as deeper, slower streams support different biota than shallow, fast moving streams.<sup>11</sup>

Second, the *Water Act* calls for the setting of a Water Conservation Objective (WCO) by Alberta Environment based on recommendations from this planning process. The WCO is the amount of water necessary to support river ecology, taking into consideration other criteria such as instream uses and fish and wildlife management.<sup>12</sup> The Government of Alberta is issued a licence for the WCO's "use" in the river, and private or non-profit groups can purchase further rights to fulfill the licence's allocation.<sup>13</sup> The province has also indicated that it would not allow the transfer of water to instream uses that exceeded the WCO through this licensing system, to strike a balance between instream and consumptive uses.<sup>14</sup>

Third, the province also added a prerequisite to a transfer referred to as "in good standing." To be in good standing, a licence holder must be able to use the water specified in a licence, and not be under any form of compliance action. In other words, the law prohibits speculating on water rights or wasting water to maintain licences in good standing.

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10 *Water Act*. R.S.A. 2000, c. W-3, s. 81(7).

11 D. McGee, interview, April 10, 2008; and F.A. Ross, interview, April 15, 2008.

12 Alberta Environment, *Water Conservation Objectives Fact Sheet*. However, a legal requirement to set a WCO within such a planning process is not clear within the Act. See Bankes and Kwasniak, *Submission to the Water Management Plan for the SSRB*.

13 The Government of Alberta holds licences purchased by third-party conservation buyers, which may be problematic if conservation buyers don't have confidence in the Government as the owner of these rights.

14 D. McGee, interview, April 10, 2008.

Fourth, the province allows water transfers within basins in which these planning processes have occurred; reviews water transfer applications; and approves transfers that meet the criteria. The province has the right to hold back 10 per cent of any transfer to meet the WCO—and has the discretion not to do so. This provision was used in only 6 out of the first 27 water trades in Alberta.<sup>15</sup>

### The Irrigation Districts Act

Agricultural water use statutes, such as the *Irrigation Districts Act*, are also an important part of the legal framework for water markets in Alberta. Under that Act, transfers occur with less scrutiny than other water licence trades. (See box “A Glimpse into Alberta’s Water Future.”) The degree of regulatory oversight of water trades varies according to which statute, and which section of a given statute, is used.<sup>16</sup> The degree of public participation also varies significantly. In Alberta, s. 33 of the *Water Act*, (Assignment of Licence), does not require prior approval, but merely requires parties to submit an electronic copy of their agreement to the provincial government official designated by the Act.

### South Saskatchewan River Basin

The water-stressed and over-allocated South Saskatchewan River Basin (SSRB) chosen for Alberta’s first transfer program has some of the province’s most productive agricultural land. Seventy-five per cent of the basin’s allocated water volume is for irrigation purposes, with most of that being held by one of 13 irrigation districts. This basin (except for the Red Deer Sub-Basin) is now closed to further surface water licences and to ground-water licences (if the groundwater is under the influence of surface water—a difficult distinction to make).

The SSRB WCOs were issued in the fall of 2006 and signed in January 2007. For each of the sub-basins of the SSRB, the WCO was set at 45 per cent of the IFN. Some argue that these WCOs are not based on the definition written in the *Water Act*: the streamflow that is *necessary* to support certain purposes, i.e., the ecology of the rivers. Their priority is set as of the date the WCOs were set, in 2006, and as such are so low in seniority as

to have little to no protective value for the rivers. In a submission to the SSRB Water Management Plan, Nigel Bankes and Arlene Kwasniak argued that these WCOs should be thrown out in favour of WCOs based on a scientific analysis of the flow rates *necessary* for the rivers’ ecologies.<sup>17</sup>

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### Alberta’s first transfer program, the water-stressed and over-allocated South Saskatchewan River Basin, has some of the province’s most productive agricultural land.

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The system has now managed 28 trades, which have mostly been from one irrigated agricultural use to another. Inter-sectoral trades (those between agricultural and municipal, industrial, or commercial uses) have been rare.

A forthcoming study of the first five years of the system’s operations found that only six permanent trades of water rights were concluded in the first five years.<sup>18</sup> These six trades accounted for only 0.05 per cent of the total water allocations in the SSRB. Three of the six trades involved sellers who had not previously been using their water right, and who were aware of the possibility of the licence being revoked for lack of beneficial use. The trades generally moved water from lower to higher value uses, and only two of the trades conveyed water over longer distances (over 100 km). Transaction costs in these trades were all below 15 per cent of the trade value, and therefore were not considered high. Only one of the trades was subject to the 10 per cent conservation hold-back, although several resulted in concessions through new conditions that achieved more than 10 per cent.<sup>19</sup>

### Are Current Planning Efforts Sufficient?

Basin-wide multi-stakeholder planning efforts have largely preceded water trading in Alberta.<sup>20</sup> Some stakeholders, such as irrigation districts, have an incentive to participate to legitimize the planning process and to

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15 Alberta Environment, “Southern Region Completed Transfers Summary.”

16 Bankes, “Legal Framework,” p. 323.

17 Bankes and Kwasniak, *Submission to the Water Management Plan for the SSRB*.

18 Nicol et al., “Case Study.”

19 D. McGee, personal communication with Katie Paris, June 11, 2008.

20 The following observations are based on the planning process in the Oldman River Basin, as per F.A. Ross, interview, April 15, 2008.

ensure water markets gain social acceptance. Others, such as environmental interests, participate to ensure that use of markets does not deplete instream flows.<sup>21</sup> Setting instream flow levels has proved to be a controversial aspect of implementing local basin management plans. When determining what the “natural” flow level is, controversy often surrounds the definition of “natural,” as ecosystems have changed, sometimes irreversibly, since settlement.

According to practitioners interviewed, the existing process is starting to build buy-in for decisions on environmental flows, even though Alberta Environment has set the WCO at levels lower than those suggested by scientific evidence. According to Rick Ross, President of the Canadian Water Resources Association, “both developers and environmentalists had their noses out of joint. But they came up with a saleable decision for the basin.”<sup>22</sup> Others remain less optimistic.<sup>23</sup> Dr. David Schindler, a leading water authority, has likened the broader assessment of Alberta’s situation to “the view from the locomotive, 10 seconds before the train crash.”<sup>24</sup> Although Alberta, in principle, has committed to protecting aquatic ecosystems, expert legal commentators believe the commitment falls short in practice and that the province has paid only spotty attention to IFNs in its actual water management decisions.<sup>25</sup>

## BRITISH COLUMBIA

In B.C., transfers are authorized under the *Water Act*, which allows “transfers of appurtenancy.”<sup>26</sup> These are transfers of water licences attached or annexed to the land. This little-used procedure provides minimal regulatory oversight and public participation. A recent example involves a reconsideration by the B.C. Environmental Appeal Board (EAB) of a water rights transfer because of potential harmful environmental impacts.

21 D. McGee, interview, April 10, 2008.

22 F.A. Ross, interview, April 15, 2008.

23 See the case study of Alberta’s water transfers in Appendix B for a closer look at the system’s shortcomings.

24 Schindler, “The Myth of Canadian Water Abundance,” p. 1.

25 Kwasniak and Quinn, “Water Under the Bridge?”

26 *Water Act*. R.S.B.C. 1996, c. 483, s. 19.

## Hotel Lake

In 2005, the EAB denied a transfer of water rights from Hotel Lake, a small lake on the Sunshine Coast, to a luxury development in Pender Harbour, British Columbia. The group that sought to block the transfer argued that the transfer would increase the amount of water extracted from the lake by 70 per cent and posed unacceptable environmental risks, especially to the continued health of an endangered species of sockeye salmon.

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### In British Columbia, transfers are authorized under the *Water Act*, which allows “transfers of appurtenancy.”

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The regional district had applied for, and been granted, the transfer—with the licences in question authorizing the diversion of over 11 million gallons of water per year from the lake. Representatives of the government submitted that they had no duty to consider the environmental impacts of the transfer according to the terms of the B.C. *Water Act*. However, the EAB disagreed, and referred the matter back to the Ministry of Environment for more studies to consider the impacts of the proposed transfer.<sup>27</sup>

As this case shows, the issue of water transfers is unsettled in British Columbia. Although this transfer was eventually blocked, it required the intervention of local residents and Ecojustice—a nonprofit environmental law organization—and highlights the concern that the *Water Act* does not include a set of procedural safeguards to protect the environment and ensure public participation in the decision-making process of such transfers.

## Section 34 of the Water Act

Another relevant avenue for transfers of water in B.C. is section 34 of the *Water Act*, which gives the comptroller the power to grant the extension of water rights. To date, most examples of extending of water rights have been from BC Hydro (although this section is open to any licence holder) to water purveyors such as the Greater Vancouver Regional District, Comox-Strathcona

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27 B.C. EAB decisions 2004-WAT-003(b) and 2004-WAT-004(b).



Regional District, or Campbell River. In these cases, the water purveyor pays BC Hydro for power values foregone for the supply of power, which is done to access gravity fed or better quality water (to save pumping or treating costs).<sup>28</sup> Although uncommon, this is another type of temporary water rights transfer possible in the B.C. context and it raises some concerns. Section 34, as is common with other sections of the *Water Act*, gives the comptroller or regional water manager the power to authorize extension of rights under a licence with no mandated environmental consideration and no requirements for notice to other licensees.

## ONTARIO

In Ontario, the primary water law—the *Ontario Water Resources Act* (OWRA)—was recently amended (primarily to implement the 2005 Great Lakes–St. Lawrence River Basin Sustainable Water Resources Agreement). The section that authorizes water-taking permits now includes a provision stating that a permit is not transferable without the written consent of an official from the Ministry of Environment.<sup>29</sup>

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### **The Ontario Water Resources Act (OWRA) was recently amended—primarily to implement the 2005 Great Lakes–St. Lawrence River Basin Sustainable Water Resources Agreement.**

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During public consultation on these changes in 2007, the Polaris Institute objected to this new provision on the ground that the law moves Ontario further toward water privatization and would allow sales of water-taking.<sup>30</sup> In fact, the government introduced this provision to clarify existing policy, and it has placed a condition in water licences that disallow transfers without authorization. An administrative transfer of an existing permit to

a new owner is an example of the limited circumstances under which a transfer might be authorized. In general, however, the topic of trade in water permits is not an issue of significant debate in Ontario.

## ONGOING ISSUES AND DEBATES

A number of issues remain contentious or unresolved in both the literature and in discussions with leaders in the field. Given space and time limitations, this brief treatment seeks only to highlight the issues for further dialogue and to outline the nature of the concerns.

### **DO WATER RIGHTS TRANSFERS INCREASE WATER CONSERVATION?**

Practitioners interviewed agreed that introducing a price signal into water allocation systems may encourage efficiency and investments in water conservation technologies. In addition, theory suggests market systems can introduce an opportunity cost to wasting water, and allowing water saved to be traded at a profit provides an incentive toward more productive uses of water.

#### **Efficiency vs. Conservation**

Of critical note, however, is that more productive (e.g., efficient) uses of water do not necessarily equate with lower total levels of water use. “More crop per drop”—in the agriculture lingo—does not mean saving water if more land is brought into production, or if water savings are simply transferred out to other sectors for intensive use elsewhere.

#### **Sleeper Rights**

Water transfers may only have a marginal impact on water conservation through water savings incentives—and may in fact create the unintended consequence of increasing water use through activation of so called “sleeper” rights. Sleeper rights are water rights that exist on paper but have not been fully or consistently used. In Alberta, such rights are abundant in the oil and gas industry,<sup>31</sup> and in municipalities and in irrigation

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28 T. White, Water Policy Officer, Innovation and Planning Team, Water Stewardship Division, BC Ministry of the Environment, personal communication with Oliver Brandes, May 28, 2008.

29 New section, 34.1(11) OWRA, as amended by the Safeguarding and Sustaining Ontario's Water Act (SSOWA). 2007, c. 12, s. 1(8). SSOWA is not yet in force, *Ontario Water Resources Act*. R.S.O. 1990, c. 0.40, s 34.1(11).

30 Polaris Institute, *Water Privatization by Permit*.

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31 The oil and gas industry possesses 7 per cent of the licenced water allocations, but uses only 3 per cent consistently, T. Payment, interview, April 16, 2008.

districts, which often do not fully use their allotted volumes. Technically, rights must have been used for beneficial uses and are subject to cancellation by the province if not “in good standing,” or not put to beneficial use for two years (the purpose being to prevent oversized and wasteful applications or water intended for resale later).<sup>32</sup> In practice, this cancellation power is rarely pursued and likely would entail significant backlash from existing rights holders.

### **Cancelling Partial Rights**

The cancellation of licences also becomes more complex in partial use situations, as, for example, when some of the water under a licence is put to beneficial use, yet a portion is not used (or simply is not usable because of a lack of capacity or other issues). According to Alberta Environment’s Dave McGee, the general informal policy is: “You can transfer what you conserve but not what you have not used.”<sup>33</sup> However, what is done in practice appears to be inconsistent with this policy. This concern is particularly acute in the case of the oil and gas industry, where allocations generally are only partly in use, and trading systems create an incentive for the transfer of unused portions of their allocations.<sup>34</sup> The question of partial rights in general will be an ongoing challenge and is a problem both for rights holders who feel they cannot benefit from this new system, and for regulators seeking to maintain adequate instream flow levels.

### **CAN WATER MARKETS REALLY HELP PROTECT THE ENVIRONMENT?**

Water rights trading can be used to secure additional water for environmental purposes. Because water trading has the potential to preserve some remaining flows or river systems, some argue that the environmental community should embrace markets “because the alternatives of more diversions of water from the few remaining flowing rivers, or an increase in groundwater pumping, are unsatisfactory.”<sup>35</sup>

32 D. McGee, interview, April 10, 2008.

33 D. McGee, interview, April 10, 2008.

34 T. Payment, interview, April 16, 2008; and D. McGee, interview, April 10, 2008.

35 Pearce and Glennon, “Transferring Mainstream Colorado River Water Rights,” p. 256.

The U.S. experience demonstrates that integrating market principles into programs to augment instream flow in rivers can have positive impacts on environmental goals. The trend in the western U.S. is toward more water transfers for environmental purposes. Between 1998 and 2005, nearly six million acre-feet of water were acquired for instream use in U.S. western states, almost two and a half times the amount acquired between 1990 and 1997.<sup>36</sup>

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**The Canadian federal endangered species legislation (the *Species at Risk Act*) does not contain mandatory habitat protection provisions similar to those contained in American legislation.**

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### **Gains From Trades or Other Legislated Requirements?**

The source of the gains is, however, not always clear. Many of the environmental gains have resulted because of regulatory requirements of federal laws, not because of the introduction of a market transfer system. The U.S. *Endangered Species Act*, for example, mandates protection of critical habitat for listed endangered species, such as the restoration of instream flows to protect aquatic endangered species habitat. The Canadian federal endangered species legislation (the *Species at Risk Act*) does not contain mandatory habitat protection provisions similar to those contained in American legislation. One recent guide to U.S. water markets notes that from 1990 to 2005, most of the activity in instream acquisitions was driven by efforts to restore flows for endangered species.<sup>37</sup> State-based water trusts have been a particularly innovative way to address IFNs, and their growth has been significant.

California has successfully used transfers to benefit the environment, though water trades still represent only a small fraction of its overall water licensing volumes. During the drought of 1991–92, the state set up a water bank to facilitate the reallocation of water. California itself ended up being one of the major buyers, using

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36 Scarborough and Lund, *Saving Our Streams*.

37 Ibid.

state resources to purchase water for instream flows. This state intervention is also increasingly common in Australia, where governments have committed significant funds for environmental water purchases.<sup>38</sup>

### Water Trusts

Other smaller programs in the U.S. Pacific Northwest have also proved beneficial. The Oregon Water Trust (OWT) attempts to remedy over-appropriation by acquiring water from consumptive users willing to sell, lease, or otherwise transfer part or all of their water right, and then transfers the water to restore or improve fish habitat and other instream uses. The Trust operates on a relatively small scale, focusing on critical smaller streams needed for habitat. From 1993 to 2005, the OWT worked with more than 143 landowners on 307 deals totaling more than 124 cubic feet per second.<sup>39</sup>

The Columbia Basin Water Transactions Program (CBWTP) is another example of a trust program. It was created in response to the degradation of fish habitat because of the large hydroelectric projects on the Columbia River. In this case, the *Northwest Power Act* and the *Endangered Species Act* both mandate restoration of habitat, and together spurred regulators to address fish habitat loss by increasing instream flows through this program. Water allocations are purchased, either temporarily or permanently, from water rights holders in targeted reaches of Columbia River Basin tributaries to increase instream flows. This allows the program to be nimble in responding to seasonal and inter-basin conditions. An outside evaluator has examined the program, and found that they have had strong success in establishing the program, building relationships with their constituents, and ultimately in getting more water into streams.<sup>40</sup> (See Appendix B for a case study of the CBWTP.)

Despite its success, it is critical to note that the CBWTP is unique. It is funded annually through federal appropriations and is a small program that leverages its budget through associations with four state and seven non-profit agencies. Furthermore, the program is nested within a much larger regulatory framework that enables trading to take place quickly and with protections in place for third parties. Lessons from this program must be interpreted cautiously, as these circumstances may not be readily replicated elsewhere.

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### The Columbia Basin Water Transactions Program was created in response to the degradation of fish habitat because of the Columbia River's large hydroelectric projects.

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### Holdbacks

The use of holdbacks—a portion of transferred water set aside for instream flows—can also result in conservation and environmental benefits. Alberta has a discretionary clause allowing for 10 per cent holdbacks in water transfers. However, holdbacks in the Alberta context are clearly only a partial answer: To date the 10 per cent holdback has only been used in 6 of 27 water trades in Alberta.<sup>41</sup> These figures emphasize that discretionary protections can potentially undermine the proposed public interest benefit they are created to serve. One Alberta regulator indicated that the conservation efforts of buyers and sellers influence the decision about whether or not to impose the holdback provision—those who have not already invested in conservation measures are significantly more likely to encounter a holdback on a trade.<sup>42</sup>

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38 Bjornlund, *Water Scarcity*.

39 Neuman, "The Good, the Bad and the Ugly," p. 441.

40 Hardner & Gullison Associates, *Independent External Evaluation*.

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41 Alberta Environment, "Southern Region Completed Transfers Summary."

42 D. McGee, interview, April 10, 2008.

## CHAPTER 5

# Going Forward: Conclusions and Action Plan

### Chapter Summary

- ◆ Water transfers and markets are not a natural evolution, but a policy choice that requires government involvement to ensure appropriate ground rules for effective functioning.
- ◆ Transferable water licences, instituted with the appropriate safeguards, can help transfer water to different uses and can encourage more efficient use of water.
- ◆ A number of issues require further analysis, including uncertainty about the impact of trade agreements like NAFTA on water traded as commercial goods.
- ◆ Water markets are not a stand-alone solution to water scarcity. They are authorized by regulation and are part of the regulatory system for water. They must be embedded in a comprehensive policy framework to be effective. There are key concerns about protecting ecosystems and the rights of certain disadvantaged segments of society.

Although a system of transferable water licences is now beginning to function in Alberta, the widespread introduction of similar systems across the country is unlikely. There are, however, a number of potential benefits associated with the use of market principles. As a tool, they may be very appropriate in certain specific situations—where, for example, there is a prior allocation system with ongoing water scarcity and a commitment (and the resources) to establish the appropriate governance infrastructure and institutions to ensure good management and appropriate oversight. In this context, water rights transfers through markets can support the process of reallocating water to usage society deems more beneficial than usage protected by “intolerably rigid” nontransferable water rights.<sup>1</sup> Transferable water licences can also expand the range of tools regulators have at their disposal to address the ongoing problem of diminished instream flows and compromised fish habitat. Tools such as creating opportunities for instream acquisitions by government or water trusts, or for the use of innovative mechanisms such as holdbacks that take a portion of transfers specifically for the environment.

However, markets are not a panacea for water scarcity. They cannot, by themselves, correct past deficiencies, remedy the problem of over-allocated systems, or solve important policy (and ultimately political) challenges. As

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1 Percy, “The Limits of Western Canadian Water Allocation Law.”

the World Business Council on Sustainable Development notes: “Business cannot buy its way out of water problems.”<sup>2</sup>

Although water markets cannot solve many of our existing problems, such as scarcity, poor management practices and inappropriate past decisions, they do have some potential—when appropriately situated in a broad package of water reforms—to increase the flexibility and adaptability of the current, overly rigid and out-of-date system. The question of whether markets have the potential to increase the share of water for environmental needs is still uncertain—with only mixed results from other jurisdictions experimenting with markets as a policy option.

## ACTION PLAN AND NEXT STEPS

### **Promote dialogue on the role of markets in water allocation and reallocation.**

The potential role of markets in water allocation or reallocation decisions is an issue of national importance. It deserves the attention of a national roundtable of water experts, community leaders and other stakeholders to fully review the issue, explore its potential applications, and consult with experts from other jurisdictions with significant experience with water markets—like California, Australia, and South Africa—to avoid mistakes and adapt lessons learned. A national dialogue should be complemented by regional discussions, particularly where persistent scarcity and prior allocation systems currently exist—such as in southern Alberta and the interior of British Columbia—as these areas are the most likely to pursue water markets.

### **Increase understanding of policy alternatives.**

A full examination of policy options to address scarcity requires more detailed research on water rights reforms (such as how to ensure basic ecological and social protection), and on institutional challenges (such as how to clearly define rights to balance the need for certainty without increasing the degree of private ownership). Further work is also required to fully understand the characteristics, contexts, and necessary safeguards needed for the appropriate use of water markets in Canada.

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### **The potential role of markets in water allocation or reallocation decisions is an issue of national importance.**

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### **Clarify trade law implications surrounding water rights markets.**

Trade agreements, especially NAFTA, may pose significant risks to water management regimes that include the buying and selling of rights, especially in situations where the buyer may be a foreign entity or where the future withdrawal of a water right may affect a foreign investment. This will require careful consideration and detailed international trade legal analysis to ensure that policy changes do not introduce unintended consequences under trade rules.

### **Establish clear ground rules and proceed cautiously.**

Good water governance requires a holistic approach to water management. The federal and provincial governments need to take a thorough look at water governance and management in Canada. Ensuring well-planned, well-managed, and well-governed water resources is a prerequisite to engaging specific tools like market-based instruments. Policy reforms such as water markets should be considered only after conducting a full investigation of local contextual factors such as history, geography, institutions, and culture.

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2 Flowers, *Business in the World of Water*, p. 43.

## APPENDIX A

# Interview Questions

### **1. Current regime/system:**

Are there opportunities for reallocation of water rights in the system(s) in which you work (or with which you are familiar)? How does the allocation system function in times of scarcity? Is there room to improve allocation within the current regime/system?

### **2. Fundamental principles:**

What are the most important principles for achieving ecological sustainability of water resources? Prosperity for communities?

### **3. Role of market principles:**

Do you see a role for market principles in allocation of water/transfers of water rights?

### **4. Benefits of market principles:**

What do you think are the benefits of incorporating market principles into water allocation? How will they help you do something you currently can't do or think should be done?

### **5. Drawbacks of market principles:**

What are the drawbacks or disadvantages of applying market principles to water allocation in times of scarcity? What are the costs?

### **6. Constraints to use of market principles:**

What are the constraints (within the current system in which you work) to implementing market principles in water transfers? Do you see potential solutions to these constraints?

### **7. Examples of market principles in practice:**

What examples of water markets are you aware of? Have you actively participated in such trading or transfers? What was your experience?

### **8. Unintended consequences:**

Should there be consideration for third parties affected by water transfers? E.g., rural communities affected by fallowing of agricultural land, with loss of income; or groundwater rights holders vis-à-vis surface rights trades?

### **9. What is water worth?**

In transfers of water rights, how is the price determined? How do we know what water is worth?

### **10. Watershed Management:**

(If watershed management has not come up in response to questions above.) How do market principles conflict or align with watershed management goals and practices? If there is no watershed management plan, is it possible to imagine trading of water rights? In practice, how are ecological values/instream flows assured?

## APPENDIX B

# Water Market Case Studies

### CASE STUDY: ALBERTA WATER TRANSFERS

#### INTRODUCTION

Alberta encompasses a semi-arid region leading from the Rocky Mountains on the western border of the province to the predominant prairie landscape of the majority of the province. Water is distributed unevenly on this landscape; the vast majority of water flowing in Alberta's rivers (87 per cent) flows north through the Mackenzie River Basin. Approximately 13 per cent flows mostly eastward across the province in the many basins that constitute the Saskatchewan River watershed, eventually draining to Hudson's Bay. This river system provides the vast majority of Alberta's population (88 per cent) with water for domestic, agricultural, and industrial uses. The Milk River flows south to the Missouri–Mississippi Basin.

Alberta's population is roughly 10 per cent of Canada's population, with 7 per cent of the land area and only 2 per cent of the freshwater supply. Water has always been a scarce resource in Alberta, and with potential changes in precipitation patterns and increases in evaporation because of climate change, it is likely to become scarcer.

#### HISTORICAL WATER RIGHTS REGIME

The historical water use and allocation system relied on the principle of first-in-time, first-in-right (FITFIR). It gave those who first applied for water allocations the senior rights to the water they demonstrated they could use, and it gave all subsequent applicants the junior

rights. While other water management systems and regulatory regimes have grown up around the FITFIR regime, it still forms the heart of the system of water allocation in the province.

Many believe the FITFIR water allocation regime is unable to cope with water scarcity. When droughts occur, as they do regularly in western North America, this system has no mechanism to “share” water between senior and junior rights holders, and no mechanism to protect the ecology of streams, rivers, and lakes by leaving water instream. Those with the most junior rights may get no water during droughts, while those with the most senior rights still have the right to full allocations. In lean years, ecosystems are compromised, and the allocation system reveals the inherent inequity between rights holders. Furthermore, in systems that are chronically over-allocated, new or changing water uses are not easily accommodated. Reforms were needed to address the inflexibility of the system, and to protect rivers and streams in times of water scarcity.

#### POLICY RESPONSE

In 1999, Alberta passed the *Water Act*, which instituted a system that permitted transfers of water allocations under a licence and permanent sales of water rights. The primary change introduced by the *Water Act* was the ability to sever the licensed allocation from the land to which it was linked. The Act also authorized the assignment of priority—the date attached to the original allocation of the water—to transferees. Water allocations

could be traded within basins, within the context of basin-wide water management plans, and with government approval. It also allows the Legislature to approve inter-basin transfers. Transfers may be either permanent or temporary, and either whole or partial. The Act also allows assignments of water allocations between current licence holders. No prior approval or notice is required for assignments.

There are several ways in which the *Water Act* was intended to ensure ecosystem protections. First, it authorizes local water management plans (funded by the province). Within the context of these plans, a given river's instream flow need (IFN) is identified. The IFN is the amount of water needed to maintain the river's ecology and is intended to be based on scientific evidence. The process of setting the IFN has proved controversial as it calls into question what the natural flow level actually is, and what kind of ecosystem the flow is intended to foster, as deeper, slower streams support different biota than shallow, fast moving streams.<sup>1</sup>

Second, the *Water Act* calls for the setting of a Water Conservation Objective (WCO) by Alberta Environment based on recommendations from this planning process. The WCO is the amount of water necessary to support river ecology, taking into consideration other criteria such as instream uses and fish and wildlife management.<sup>2</sup> The Government of Alberta is issued a licence for the WCO's "use" in the river, and private or non-profit groups can purchase further rights to fulfill the licence's allocation.<sup>3</sup> The province has also indicated that it would not allow the transfer of water to instream uses that exceeded the WCO through this licensing system, to strike a balance between instream and consumptive uses.<sup>4</sup>

Third, the province also added a prerequisite to a transfer referred to as "in good standing." To be in good standing, a licence holder must be able to use the water specified

in a licence, and not be under any form of compliance action. In other words, the law prohibits speculating on water rights or wasting water to maintain licences in good standing.

Fourth, the province allows water transfers within basins in which these planning processes have occurred, reviews water transfer applications, and approves transfers that meet the criteria. The province has the right to hold back 10 per cent of any transfer to meet the WCO—and has the discretion not to do so.

### THE TRACK RECORD

The system has now managed 28 trades, which have mostly been from one irrigated agricultural use to another. Inter-sectoral trades (those between agricultural and municipal, industrial, or commercial uses) have been rarer.

A forthcoming study of the first five years of the system's operations found that only six permanent trades of water rights were concluded in the first five years.<sup>5</sup> These six trades accounted for only 0.05 per cent of the total water allocations in the South Saskatchewan River Basin (SSRB). Three of the six trades involved sellers who had not previously been using their water right, and who were aware of the possibility of the licence being revoked for lack of beneficial use. The trades generally moved water from lower to higher value uses, and only two of the trades conveyed water over longer distances (over 100 km). Transaction costs in these trades were all below 15 per cent of the trade value, and therefore were not considered high. Only one of the trades was subject to the 10 per cent conservation hold back, although several resulted in concessions through new conditions that achieved more than 10 per cent.<sup>6</sup>

One trade that has attracted much attention occurred near Balzac, Alberta, in which a casino, horse racing track, and mega-mall were under construction when Alberta Environment closed the majority of the SSRB to new water permit applications. The municipal district, which supplies water to the development, had to look elsewhere for water. Their first proposal—to pipe water 200 km away from the Red Deer River—met with a

1 D. McGee, interview, April 10, 2008; and F.A. Ross, interview, April 15, 2008.

2 Alberta Environment, *Water Conservation Objectives Fact Sheet Submission to the Water Management Plan*

3 The government holds licences purchased by third-party conservation buyers, which may be problematic if conservation buyers don't have confidence in the government as the owner of these rights.

4 D. McGee, interview, April 10, 2008.

5 Nicol, et al., "Case Study."

6 D. McGee, personal communication with Katie Paris, June 11, 2008.



loud public outcry. The casino ended up paying an irrigation district C\$15 million to implement efficiency measures (lining canals) to free up enough water to feed the development. This water was a permanent licence transfer from the Western Irrigation District to the Municipal District of Rocky View, which paid a record C\$7500/acre foot.<sup>7</sup>

The SSRB WCOs were issued in the fall of 2006 and signed in January 2007. For each of the sub-basins of the SSRB, the WCO was set at 45 per cent of the IFN. Some argue that these WCOs are not based on the definition written in the *Water Act*: the streamflow that is *necessary* to support certain purposes, i.e., the ecology of the rivers. Their priority is set as of the date the WCOs were set, in 2006, and as such are so low in seniority as to have little to no protective value for the rivers. In a submission to the SSRB Water Management Plan, Nigel Bankes and Arlene Kwasniak argued that these WCOs should be thrown out, in favour of WCOs based on a scientific analysis of the flow rates *necessary* for the rivers' ecologies.<sup>8</sup>

## CONCLUSIONS

This system has worked well for some who have executed trades, but critics point out shortcomings.

One of the main shortcomings is the lack of a “clearing-house” or an actual marketplace—such as an auction, a broker organization, or a website—that would consolidate a list of willing sellers and buyers. The current situation can be hit-and-miss, with people placing ads in small-town papers, and without a clear marketplace to buy and sell.

The system lacks transparency. Potential trades must have a public review, but often the financial terms of the deals are not known, and the pricing is not transparent. In many cases, the revision of the terms of the licence is not subject to public scrutiny and the changes

in use can have significant impacts on communities and third parties.<sup>9</sup> The licence documents that result from a transfer are public documents and, since May 2008, are posted on the “Licence Viewer” portion of the Alberta Environment website.<sup>10</sup> However, water supply agreements conducted within irrigation district and municipal licences and municipal licences fall outside the boundaries of this system of transfers and are therefore subject to even less scrutiny.

Some would argue that the market has evolved too quickly, without having adequate measures in place to protect river and stream ecology. It may take some time to establish adequate WCOs for rivers and streams that must be protected. Nevertheless, and even in the absence of adequate “science-based” WCOs, the market is being encouraged.<sup>11</sup> Others are concerned that the entire transfer approval process is not nimble enough, and that a true marketplace will not emerge until executing transfers is less cumbersome.

It is also not clear that Alberta Environment is actively seeking to take back “sleeper” water rights, or those that have not been used in three years. In 2005, 55 per cent of all licensed allocations in the province were used.<sup>12</sup> Irrigation districts alone have the power to drastically change current patterns of use: they are allocated 43 per cent of all water in Alberta, and 63 per cent of all licensed allocations; most seldom use their full allocation.<sup>13</sup> Selling surplus irrigation rights has the potential to greatly reconfigure use in some basins.<sup>14</sup>

Some have critiqued the concept that an allocation under a licence must have a beneficial use to be tradable. The oil and gas industry has many under-used allocations in

7 D'Aliesio, “Putting a Price on Water.”

8 Alberta Environment, *Submission to the Water Management Plan for the SSRB*.

9 However, those directly affected by a transfer may appeal a decision to the Environmental Appeals Board.

10 The Licence Viewer can be found at: [www.albertawater.com/index.php?option=com\\_content&view=article&id=69&Itemid=75](http://www.albertawater.com/index.php?option=com_content&view=article&id=69&Itemid=75).

11 Bankes, “The Alberta Context.”

12 Alberta Environment, *Current and Future Water Use in Alberta*.

13 *Ibid.*, p. iv. In dry years, such as 2001, all allocations available to irrigation districts were used (D. McGee, interview, April 10, 2008).

14 Chong and Sunding, *Fight to the Last Drop*.

areas where their conventional oil reserves are decreasing and the only tradable allocations are those that result from conservation efforts. From the perspective of the industry, these underused licences present opportunities for oil and gas companies to sell their water rights for a profit, or to trade them for instream flows to fulfill the WCOs.<sup>15</sup> The regulator's perspective is that if these rights are not currently being put to beneficial use, they are not tradable for any purpose—including instream flow or alternative use. This is an unresolved area of potential conflict.

Others worry about the longer-term impacts of changes in the use of water from irrigation (generally, food production) to non-essential uses (such as golf courses and commercial activities). The transfer system makes no judgment about the change in uses. There is a period for public comment, but in the end sellers and buyers only have to show that they harm neither the environment nor third parties. Economic and social changes that transfer water out of agriculture and into commercial, municipal, and industrial uses are wildcards.

Finally, data collection and information about stream flows and monitoring and enforcement of terms of licences is crucial, and probably under-resourced.<sup>16</sup>

## CASE STUDY: CALIFORNIA WATER MARKETS

### INTRODUCTION

Water scarcity and drought have been features of life in California throughout its modern history. California has a varied geography with a largely semi-arid climate. Water distribution is seasonally variable with wet winters and dry summers. Sustained droughts, high rainfall years, and 70 per cent of the annual runoff in the less-populated northern portion of the state make large storage facilities necessary and complicate the challenge of distribution over time and space.

Through the 1970s, water managers generally dealt with scarcity by increasing infrastructure. They built dams, aqueducts, canals, and other storage and conveyance facilities. However, increasing environmental costs and political resistance made further storage and conveyance projects unfeasible. California has turned to other tools—including water markets, banks, and transfers—to address its management challenges.

### HISTORICAL WATER RIGHTS REGIME

In California, water transfers are a significant part of a complex regulatory system involving common law principles, constitutional provisions, state and federal statutes, court decisions, and contracts or agreements. Transfers of water are not a new phenomenon; they have been part of the state's water history since an 1859 court ruling. The *California Water Code* states that the people of California own the water, and rights to use water are subject to the state's obligation to protect the water resource uses in waterways—such as navigation, fisheries, recreation, ecological preservation, and related beneficial uses—under the public trust doctrine.

### POLICY RESPONSE

California began to promote more water trading in the late 1970s as a response to drought, but also in recognition of the prospect of shortages because of a burgeoning population and limited new sources. The Governor of California struck a commission to review the laws on water rights in response to a 1978 drought. One area of focus for the commission's final report was on removing barriers to water transfers and increasing incentives and protections for potential transferors. It also made recommendations for regulatory oversight.<sup>17</sup>

The State Water Resources Control Board (SWRCB) is the chief approval agency for transfers. A state water bank was established in 1991. A proposed *Model Water Transfer Act*—drafted in 1996 under the sponsorship of the California Business Roundtable, the California Chamber of Commerce, the California Farm Bureau Federation, and the California Manufacturers Association, and the subject of much legal and policy commentary—has yet to be passed.

15 T. Payment, interview, April 16, 2008.

16 Rosenberg International Forum, *Report on Water Policy*, p. 6. This report applies to the entire "Water For Life" Strategy, but its recommendation on adequate budgets for implementation certainly extends to the market transfers program. Several interviewees also pointed out the need for adequate budgets.

17 California Governor's Commission to Review California Water Rights Law, *Final Report*.

A number of significant water agreements affect water transfers, particularly the two largest water projects in California—the 1995 to 1996 State Water Project and the 1991 Central Valley Project—as well as the CALFED Bay/Delta agreement of 2000 and its Environmental Water Account, which gave greater responsibilities to both state and federal agencies in water transfers. The California Water Plan notes that a large portion of water transfers each year occur under the guidance of, or funded by, a state or federal program.

### TRACK RECORD

A recent analysis of water transfers across the American West between 1987 and 2005 showed that California was one of the leaders in transferring water from agricultural to environmental uses. Since 1996, the increase in water trades has been driven predominantly by environmental demands.

Each year approximately 1.2 million acre-feet of water are transferred under various provisions of various laws and agreements. Hanak (2003) points out that California's water market only accounted for 3 per cent of total annual water use, as of 2001. Agricultural water districts are the main sellers accounting for three-quarters of all sales, while state and federal agencies are the next biggest player in the market, running water banks to address drought and buying water for environmental programs.

Water transfers commonly take place between water users within water districts under the rules each district has developed for allocation. Transfers between water districts within the same basin have become more common in recent years. Because of concerns over water transfers, however, many counties have adopted ordinances restricting groundwater transfers.

California has 19 adjudicated groundwater basins and basins in which a local agency has obtained statutory authority to manage groundwater, and in many places, to regulate transfers, a common activity in Southern California groundwater basins.

California's official State Water Plan commends the application of market forces as an effective way to achieve a balance between supply and demand, to facilitate efficiency by disclosing noncompetitive and inefficient water users, and to stimulate use of technical and procedural innovations to maximize water use efficiency.

However, a Task Group report to the SWRCB on water transfer issues in California notes that:

The use of water involves an unusually complex mix of price responsive and non-price responsive social values. The complexities include interrelations among consumptive water uses, in stream public trust needs, and the sometimes contradictory imperatives of managing other relatively non-consumptive uses such as power generation, flood control, and recreation. Moreover, market forces are less effective when there is a long time lag between the time that a predictable shortage of an essential commodity, such as food, is reflected in a price rise and the time it takes either to increase supply or adapt to the shortage when it occurs. Thus, at times, market forces can fail to achieve the highest social welfare because of interests that are not considered within private bargaining. In these circumstances, focused regulation and government intervention are necessary to protect social interests that are not price responsive.<sup>18</sup>

In particular, concern has been expressed over the extent to which agricultural lands may be lost, and the potential effect of that loss, if transfers are increased.

To address these tensions, state oversight is a critical part of the water transfer approval process. The *California Water Code* provides that three factors must be evaluated, regardless of which approval process is used for the water transfer:

1. The prevention of injury to other legal users of water, (the “no injury” rule).
2. The avoidance of unreasonable effects on fish and wildlife.

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18 Water Transfer Working Group, *Water Transfer Issues*, p. 12.

3. If water is moved by the State Water Project or other state, regional, or local public agencies, actions needed to avoid the unreasonable effects on the overall economy in the county from which the water is transferred.

## CONCLUSIONS

The major issues for water transfers in California include the need to maintain agricultural productivity, protecting the environment from the cumulative impacts of both short- and long-term transfers, and economic concerns because of crop idling and other impacts to agricultural communities that trade their water away. It remains difficult to quantify third-party effects, and there is still considerable public resistance to water transfers, primarily because of concerns about falling and decline in agricultural communities.

The California example shows that fostering water markets is a complex undertaking requiring significant state intervention to set the conditions for the markets and provide regulatory oversight.

## CASE STUDY: COLUMBIA BASIN WATER TRANSACTIONS PROGRAM

### INTRODUCTION

The Columbia River Basin comprises most of the Northwestern United States, taking in much of four states (Idaho, Montana, Oregon, and Washington) and some of Southeastern British Columbia. It is the fourth largest river in North America by volume and the most productive hydropower-producing river in North America, with 14 major dams in the U.S. and Canada on the main stem of the river, and over 400 dams in the whole basin.

The dams serve many purposes: storage for irrigation, flood control, navigation, and hydropower. They have also severely harmed the habitat of the anadromous fish populations that once thrived in the basin. The dams pose physical barriers for these fish, which must swim upstream to their original hatching sites to spawn and reproduce. The Columbia Basin Water Transactions Program (CBWTP) addresses this threat.

### HISTORICAL WATER RIGHTS REGIME

The prevalent water rights regime in this basin is a first-in-time, first-in-right, prior appropriation regime. The Bonneville Power Administration is the agency responsible for the hydropower distribution within the basin, but it is not directly responsible for water management or for ensuring adequate instream flows in tributaries. Over-allocation of water rights is an increasing problem within the basin, with some streams suffering low flows and others even drying up. Much of the water is used for crop irrigation and irrigation of pasturage for livestock. Before the CBWTP was established, the only methods used to ensure water flows in streams were inconsistently applied regulatory tools.

### POLICY RESPONSE

The CBWTP was formed in 2002 as a response to the requirements in the *Endangered Species Act* and the *Northwest Power Act* to improve habitat for endangered fish species in the Columbia River Basin. It does this by purchasing water rights, both permanent and temporary, mainly from farmers and ranchers, and leaving that water in streams to improve stream ecology for fish such as endangered salmon. Put simply, its goals are to:

1. Acquire ecologically significant water through market-based transfers.
2. Build organizational capacity for its partner agencies.
3. Increase awareness about this approach and set of tools among Pacific Northwestern communities, water users and others.<sup>19</sup>

The CBWTP is a partnership of the National Fish and Wildlife Foundation, the Bonneville Power Administration (BPA), and the Northwest Power and Conservation Council. The BPA is a federal government agency that distributes and markets the electricity generated by hydropower facilities within the Columbia River system. The BPA is charged with mitigating the hydroelectric dams' impacts on fish habitat, and spends US\$145 million per year on fish and wildlife projects. In fiscal year 2008, US\$4 million is budgeted for the CBWTP: US\$2.2 million is budgeted for water acquisitions, and US\$1.8 million to support the CBWTP's local partner

19 CBWTP, "Environmental Water Transactions," p. 14.

organizations, or “Qualified Local Entities” (QLEs). QLEs include four state-wide water management agencies, and seven non-profit groups such as the Oregon Water Trust, Deschutes River Conservancy, and Trout Unlimited. These are the groups that actually perform the water transactions, with program and technical support from the CBWTP. State agencies ensure transactions conform to state law and policy. Collaborative efforts between the non-profit and state-level QLEs are a cornerstone of the program.<sup>20</sup>

Most of the tributaries the CBWTP focuses on are smaller reaches upstream of the Columbia River’s hydro projects; they are typically tributaries of tributaries. There is no storage upstream in general, so “every year is a drought year for fish.”<sup>21</sup> The program therefore aims to purchase water strategically for stream reaches in which fish habitat is degraded or threatened by low flow levels.

CBWTP Program Director Andrew Purkey identified the four most important principles needed for a water transactions program to achieve the ecological sustainability of the water resource *and* prosperity for communities.<sup>22</sup>

- ◆ First, clearly defined water rights are essential—ambiguities complicate or derail potential trades.
- ◆ Second, established regulatory processes are needed to ensure that the conversion of a water right from an existing use (such as irrigation) into a new use (for instream flow) follows a predictable and efficient process.
- ◆ Third, there is a need for a culture of acceptance of water trades as a legitimate option for water users (usually ranchers, in this case) to pursue. In the past, irrigators would not have considered the potential asset value of their water right, as there were no real options. At first, certain agricultural organizations expressed some resistance to the program, so the CBWTP had to overcome these cultural hurdles. Now, however, they think that most irrigators are aware of transactions as an option for their water right and this barrier is being removed.

- ◆ Fourth, trades must be based on an ecological benefit for some *stated objective*. In practice, this means identifying specific reaches of streams that need water for certain fish at certain stages in their lifecycles.

In general, trades are not “all or nothing.” A minority of transactions are permanent transfers; most are partial in nature. Transactions take many forms, such as shifting the timing of diversions, reducing irrigated acreage by a specified portion, creating efficiencies and trading the surplus, or substituting diverted water with another water source (often groundwater) that is not connected hydrologically to the surface water right. If the program can provide sufficient funds for a rancher (the most common type of seller in this program) to purchase feed for his livestock, it can overcome a common barrier to transactions. Also, it usually does not take that much water—as a proportion of total diversion rights—to make a difference to the fish, so deals that are partial in nature are much more feasible than permanent transfers.

Third-party injury problems have made opportunities for efficiency-based trades relatively rare. Third parties often rely on return flows, so the program has had more difficulties executing this type of transaction. They have been possible in cases where downstream users are disconnected hydrologically from return flows. For example, in the Deschutes River system, water diverted for agriculture seeps through cracks in the local geology and is not returned to the river for third-party usage. It flows through subsurface channels and feeds a reservoir significantly downstream. CBWTP and Deschutes River Conservancy funding was used to line agricultural ditches to achieve conservation, which allowed less water to be diverted and left surplus flows instream. There were no third-party injuries because the instream water was, in effect, “new water,” so the usual barriers to the transaction did not exist.

CBWTP transactions can take as little as five weeks to go through an approval process with the Northwest Power Authority, and are therefore responsive to new needs annually. This system is much faster at adapting to seasonal and regional conditions than any other method. Other fish protection strategies are much less nimble. For example, the BPA’s habitat restoration project funding

20 This description was drawn from both “Environmental Water Transactions” and from the interview with A. Purkey, April 23, 2008.

21 A. Purkey, interview, April 23, 2008.

22 Ibid.

(US\$145M), builds fencing, restores stream banks, and funds other such direct interventions. These are planned as minimum year-long projects and, while valuable to fish habitat restoration, do not achieve the same objectives (instream flows) that the transactions program does.

This program faces a particular challenge in pricing water fairly and accurately. The program must be judicious in obtaining the most water it can given its limited resources; but sellers will not be forthcoming if prices do not reflect the water's value. There are various tools to set the price for purchases, none perfect and all fairly complex. These include:

- ◆ appraisals of land with and without water rights (according to stringent federal appraisal guidelines) used to determine comparable sale prices;
- ◆ farm crop budget analyses (analyzing the costs and proceeds of certain crops,) used to derive an estimate of the additional value created by water; and
- ◆ comparables, or sales comparisons, to other water trades in areas where such comparables exist.

### TRACK RECORD

From 2003 to 2006, the CBWTP participated in the funding for 153 water transactions:

- ◆ 120 were short in duration (five years or less);
- ◆ 16 of those were long term (10–30 years); and
- ◆ 17 were permanent.

By the fourth year of the program (2006), there was 124 GL (100,000 acre feet) more water instream as a result of the transactions funded by the CBWTP and its partners.<sup>23</sup>

In 2007, the program retained the consulting firm Hardner & Gullison to conduct a program evaluation. Their report found that the program, while young, has managed to achieve significant success in establishing a market for instream flow and in actually increasing instream flow in many reaches. The report concludes:

The CBWTP has also been responsive to the need to ensure that water transactions result in increased instream flow, and has established reliable monitoring systems to do so. Where CBWTP can

improve is in ensuring that water transactions result in gains for anadromous and resident fish habitat. To date, the integration of water transactions with projects to address other ecological limiting factors has been weak. The result is that many reaches where flow is addressed continue to lack other key ecological attributes to serve as adequate fish habitat.<sup>24</sup>

In essence, more water does not necessarily mean more fish. Other ecologically limiting factors complicate the picture, such as the shape of the streambed, the temperature of the water, the presence of other types of organisms in the water, and water quality. While the CBWTP's sister program at the BPA is charged with the larger challenge of restoring fish habitat, the water transactions program also needs to improve interagency coordination to have an impact on these other limiting factors over time. More resources are needed to monitor the presence of fish in streams, and to better understand other ecologically limiting factors.

### CONCLUSIONS

The CBWTP is a unique program. It is funded annually through federal appropriations; it is a small program that leverages its budget through associations with four state and seven non-profit agencies; and it exists to mitigate the damage done to fish habitat by the enormous hydroelectric projects that have so affected the ecology of this whole basin. The lessons from this program must be interpreted cautiously, as these circumstances will not be easily replicated elsewhere.

However, the program shows that under the right circumstances, market-based transfers have a role to play in good water governance:

- ◆ Water transactions have expanded the number of tools available to address the ongoing problem of diminished instream flows and compromised fish habitat.
- ◆ The program provides the ability to be nimble in responding to seasonal and inter-basin conditions.
- ◆ The program is nested within a much larger regulatory framework that expedites trading and protects third parties.

23 CBWTP, "Environmental Water Transactions."

24 CBWTP, *Independent External Evaluation*.

## APPENDIX C

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