Wading into Uncertain Waters: Using markets to transfer water rights in Canada—possibilities and pitfalls[*]

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Water scarcity is emerging as a real challenge in Canada and is increasingly affecting individuals, communities, and businesses. In some of Canada's most populated areas and in key agricultural regions, limits to water use are becoming necessary and impacting community prosperity. Climate change further challenges water sustainability by changing precipitation patterns affecting timing and availability of fresh water and potentially increasing regional water scarcity.

Canada's first-in-time, first-in right western water allocation systems entrenches inflexibilities and places insufficient weight on ecosystem needs or priority uses. Policy responses to emerging water challenges often include proposals to increase the use of market principles in water allocations. Market mechanisms can help reallocate water among human uses and may assist in protecting ecosystems. Despite this, the potential of water markets are limited as they are unable to correct existing poor management practices and failing governance nor solve existing over-allocation problems. Water markets, to be successful, require basic institutional and legal safeguards. In Canada, continued dialogue, increased understanding of policy options, and careful ground rules are basic pre-requisites before any expansion of the role of markets as a water allocation tool should even be considered.

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[*] This article is an adapted version of the report *Going with the Flow? Evolving water allocations and the potential and limits of water markets in Canada* (2008) by Oliver M Brandes, Linda Nowlan and Katie Paris, Conference Board of Canada, Ottawa, Ontario, December 2008. Available at <www.poliswaterproject.org>.

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1. INTRODUCTION—WATER MARKETS AS A RESPONSE TO WATER SCARCITY

> *"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."*[1]
>
> World Business Council on Sustainable Development

Water scarcity will affect all of society including virtually all businesses either directly or indirectly over the next few decades. Canada, despite its seemingly immense water wealth, is not immune to water scarcity, especially in the more populated and key agricultural parts of the country such as Southern Alberta, the Okanagan Basin, and parts of Ontario. Overuse, population pressures, and degradation of water bodies are all potential causes of water scarcity. Droughts and changing weather patterns due to climate change will also increasingly affect supplies. Greater use of markets to allocate water is one policy response to scarcity that is receiving more attention worldwide and rapidly emerging in the western regions of Canada. This article provides an overview of the key considerations that might inform the use of markets as a tool in the Canadian context and offers some priority policy directions for governments.

(a) Transferring water rights in context

A critical aspect of the water challenge is to manage water allocations sustainably, 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.

There are various options for obtaining more water or changing water from its existing

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[1] B. Flowers, *Business and the World of Water—WBCSD Water Scenarios to 2025*. (Geneva: World Business Council on Sustainable Development, 2006) 43. Emphasis added.

allocated uses in times of scarcity:[2]

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*); and
5. Reallocate water from current uses to new ones through water market and trading (*water rights transfer*).

This article addresses the final option, increasing the use of markets to facilitate water rights transfers. Integrating market principles is, however, not necessarily a "natural evolution" of water allocation systems but instead one possible policy choice of many with specific benefits and consequences (as well as responsibilities), which will be explored in this article.

(b) Purpose and Methodology

This article reviews the potential benefits and limits of introducing market-based transfers of the right to use water (often called water markets) into Canadian water allocation regimes to address water scarcity. The material for this article is adapted from a detailed report on the application of market-based principles to water allocations prepared for the Conference Board of Canada as part of their series on water governance.[3] The research for that more detailed report included a review of some of the leading literature, investigation of a variety of case examples, and a series of interviews and input from leading Canadian water experts from across disciplines and sectors. Key insights and core conclusions are captured here in this adapted review.

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2 This list of options is adapted from R. Glennon, *Water Scarcity, Marketing and Privatization* (2005) *Texas Law Review* 83(7), 1873-1902.

3 *Evolving water allocations and the potential and limits of water markets in Canada* (Ottawa, ON: Conference Board of Canada).

2. WATER RIGHTS AND WHY THEY MATTER

> *"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."*[4]
>
> *Sandra Postel,*
> Director and Founder Global Water Policy Project

When water is abundant, defining water rights between 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.

(a) Differing conceptions of water rights as property rights

Water rights are a type of property right. Property rights may be thought of in the broadest terms as "the claims, entitlements, and related obligations among people regarding the use and disposition of a scarce resource."[5] 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; property rights are bundles of rights that different parties may hold.[6] These bundles can be separated into various categories including:

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4 S. Postel, *Last Oasis—Facing Water Scarcity* (New York, NY: Norton and Company, 1997).

5 E.G. Furubotn & S. Pejovich, *Property Rights and Economic Theory: A Survey of Recent Literature* (1972) *Journal of Economic Literature*, 10(4), 1137-1162.

6 E. Schlager & E. Ostrom, *Property Rights Regimes and Natural Resources: A Conceptual Analysis* (1992) *Land Economics*, 68 (3), 249-62.

- 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 in Canada:[7]

- *Public property (bureaucratic allocations)*—the state holds rights usually with government agencies, through deferred authority, directing 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 institutional form 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 use right being held by individuals, corporations or organizations, and water being 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 emerging in southern Alberta and increasingly common in the western parts of the US and throughout Australia.

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 employed within a given basin, with some groups of users making collective choices at the same time that individual farmers engage in transfers, and agency administrators allocate water resources through licenses and regulations.

(b) Legal and regulatory frameworks for water rights in Canada

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[7] B.R. Bruns, C. Ringler & R. Meinzen-Dick, eds., *Water rights reform: lessons for institutional design* (Washington, D.C: International Food Policy Research Institute, 2005), 7.

Water allocation systems set out in provincial water laws and regulations in Canada decide who gets to use what share of water in times of scarcity. Historically these systems have not allowed licensed users to trade their allotted shares of the resource. Users, such as municipalities, irrigation districts, or larger industrial users, obtain rights to water through these allocation systems which vary widely across Canada.[8]

Water allocation systems provide the rules and procedures through which rights are assigned, and how water should be shared between the industrial, agricultural, municipal, and domestic sectors.

(i) *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. The provinces have primary responsibility for the regulation of surface and groundwater with water generally owned and managed by the Crown.[9] 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 evolved to address the range of differences in climate, geography, and development priorities across the nation with the eventual 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

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8 This is different from municipal water service, the method by which the vast majority of Canadians including many businesses access water. This report focuses on allocated rights.

9 For example S. 2 of BC'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 licenses issued or approvals given under this or a former Act. *Water Act*. R.S.B.C. 1996, c. 483, s. 2.

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].

- *Civil law tradition*—a hybrid system based on riparian rights and adapted from a civil law tradition [Quebec].
- *Prior Allocation*—enshrines the principle of "first-in-time, first-in-right" 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" [BC, Alberta, Manitoba and Saskatchewan].
- *Authority management approach*—where government delegates responsibility for allocation decisions to various regional or resource boards or bodies [Yukon, Nunavut and the Northwest Territories].

(ii) *Groundwater—the often forgotten resource*

Groundwater rights evolved differently. English judges applying common law principles to water conflicts extended riparian rights to groundwater flowing in defined channels. For all other sources of groundwater the rule of absolute capture applied: landowners could use water under their soil regardless of any injury caused to their neighbours. Evidence of this distinction is still apparent, as most water allocation systems in Canada do not adequately address groundwater; for example B.C. minimally regulates groundwater, and does not require licences for the majority of groundwater withdrawals.[10] Naturally, this creates significant challenges for any water allocation reform process.

Ground and surface water are part of the same resource.[11] Experts increasingly recommend integrated ground and surface water management[12] since groundwater licensing is a crucial component of addressing water scarcity. Otherwise 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.

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10 L. Nowlan, *Buried Treasure: Groundwater Permitting and Pricing in Canada (*Toronto: Walter and Duncan Gordon Foundation, 2005).

11 T.C. Winter, J.W. Harvey, O.L. Franke & W.M. Alley, *Ground Water and Surface Water: a Single Resource* (1998) *U.S. Geological Survey Circular*, 1139.

12 Report of the Rosenberg International Forum on Water Policy to the Ministry of Environment. (2007). Province of Alberta, 14.

(c) Potential for water rights transfers in Canada

Except in a few local areas where certain stream reaches or groundwater aquifers are stressed, water is generally viewed as abundant enough in Canada that a potential new water user can easily obtain government approval for use. For example, in the Canadian portion of the Great Lakes basin, most other river basins east of the Manitoba-Ontario border, and in the northern territories, current water withdrawals are less than 5% of the renewable supply, and consumptive use (excluding return flow) is generally less than 1%.[13] Therefore the only regions significantly dealing with scarcity—a fundamental requirement for markets to function—are in the Prairies and parts of BC, where the prior allocation administrative regime uses the guiding principle of *first-in-time, first-in-right* (FITFIR) as the basis for the legal framework.

Prior allocation[14] and FITFIR ensure the earliest granted licensee (the "senior" rights holder) is entitled to receive the entire amount stipulated in their license 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.

This model has become increasingly complex over the years as specific amendments have been created in response to emerging concerns. The following are four features of the basic western model that remain substantially unchanged in all western jurisdictions:[15]

- Crown retained ownership of water;
- Crown distributed rights to water on a first come, first serve basis;
- Water rights historically granted for an indefinite period are now being granted for a specific term; and,
- Competition between licensees for the available supply of water was governed in law, but not always in practice, by prior allocation.

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13 R. de Loe, personal communication, May 9, 2008.

14 Prior allocation is the Canadian application of the "prior appropriation" concept more commonly found in the US. It holds that the date of license issue (not the date of the appropriation itself) is what establishes seniority.

15 D. Percy, *The Limits of Western Canadian Water Allocation Law* (2004) *Journal of Environmental Law and Practice*, 14, 313-27.

To free up water for new users, this system has in some cases been modified to recognize the relative importance of different uses.[16] Statutory preferences list the main uses in priority, usually listing domestic uses first (or exempting it from the licensing requirement), followed by municipal, industrial, irrigation and finally, other uses. A new user who requires water for a higher purpose can apply to the Minister for the cancellation of an existing license used for an inferior purpose.

(d) Limits of existing systems and options forward

Decision-makers continue to focus on tradeoffs between urban, agricultural and industrial consumption when allocating water, often paying inadequate attention to ecosystem needs.

In many cases the administrative rules that guide these decisions share the same central defects of the common law systems in that they do not promote the optimum use of water and are too rigid to adapt to changing societal priorities. Recent detailed analysis of the "first-in-time, first-in-right" system prevalent in Canada's west outlines a number of systemic weaknesses of this system including:[17]

- limited promotion of water conservation and efficiency;
- insufficient consideration of environmental and social equity factors in allocation decisions, and,
- lack of flexibility in the face of uncertainty.

(i) *A holistic approach to water governance and management reform*

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16 D. Percy, *The Framework of Water Rights Legislation in Canada* (Calgary: Canadian Institute of Resources Law, University of Calgary, 1988) 24; A. Lucas, *Security of Title in Canadian Water Rights* (Calgary: Canadian Institute of Resources Law, 1990).

17 For a more detailed discussion see O.M. Brandes & T. Maas, *What We Govern and What Governs Us: Developing Sustainability in Canadian Water Management* (June 2006). Paper presented at the 59th Annual Conference of the Canadian Water Resources Association, Toronto; and, L. Nowlan, *Buried Treasure: Groundwater Permitting and Pricing in Canada* (Toronto: Walter and Duncan Gordon Foundation, 2005).

Many options—including developing water markets—exist to deal with the challenge of water scarcity, they include: administrative procedures; involuntary sales; equitable apportionment; litigation; and, formal and informal negotiated agreements. Ultimately, society needs to choose how, and *who*, should 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?

> "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."[18]

Recent research outlines the role of water allocation as part of a broader strategy towards water security and sustainability.[19] Water governance is shifting from the historical approach that

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[18] R. Christensen & A. Linter, *Trading Our Common Heritage—The Debate over Water Rights Transfers in BC.* In K. Bakker, ed., *Eau Canada—The Future of Canada's Water* (Vancouver: University of British Columbia Press, 2006).

[19] See for example K. Bakker, ed., *Eau Canada: The Future of Canada's Water* (Vancouver: University of British Columbia Press, 2007); Pollution Probe, *A New Approach to Water Management in Canada* (March 2008). Retrieved from <http://www.pollutionprobe.org/Reports/MediaRelease-VisionandStrategy-Mar2008Eng.pdf>; T.J. Morris, D.R Boyd, O.M. Brandes, J.P. Bruce, M. Hudon, B. Lucas, T. Maas, L. Nowlan, R. Pentland & M. Phare, *Changing the Flow: A Blueprint for Federal Action on Freshwater* (2007) The Gordon Water Group of Concerned Scientists and Citizens. Retrieved from <http://www.gordonwatergroup.ca/PDF/ChangingtheFlow.pdf>. F. Sanford, *Water, Weather and the Mountain West* (Rocky Mountain Publishing Company, 2007); and, T. Banks & E. Cochrane, *Water in the West: Under Pressure* (November 2005). Fourth Interim Report, Ottawa: Standing Senate Committee on Energy, the Environment and Natural Resources. Retrieved from <http://www.parl.gc.ca/38/1/parlbus/commbus/senate/com-e/enrg-e/rep-e/rep13nov05-

emphasized freshwater withdrawals for economic development and large-scale modifications of aquatic systems through dams, reservoirs and diversions to more of an ecosystem-based management (ESBM) approach which recognizes the ecological limits on the amount of water that can be safely removed from watersheds. 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 the aquatic system. Caps must be adjustable and flexible enough (for example by establishing proportions as percent of the whole instead of absolute volumes) to respond to changing conditions and new information (such as impacts associated with climate change).

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 Australia, Europe and South Africa.[20]

3. DEALING WITH SCARCITY THROUGH WATER RIGHTS TRANSFERS AND MARKETS—OPTIONS AND OPPORTUNITIES FOR CANADA'S WEST

> "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

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[20] For recent explorations of this topic see Chapter 5: Water Allocations for the 21st Century, O.M. Brandes, K. Ferguson M. M'Gonigle & C. Sandborn, *At a Watershed: Ecological Governance and Sustainable Water Management in Canada* (Victoria: University of Victoria, (2005). The POLIS Project on Ecological Governance, 51-62; O.M. Brandes & T. Maas, *What We Govern and What Governs Us: Developing Sustainability in Canadian Water Management* (June 2006). Paper presented at the 59th Annual Conference of the Canadian Water Resources Association, Toronto. Retrieved from <http://www.waterdsm.org/pdf/whatwegovern_june06.pdf>; and, S. Postel & B.D. Richter, *Rivers for Life: Managing Water for People and Nature* (Washington, DC: Island Press, 2003).

if left to its own forces, it could prove a very unforgiving master."[21]

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Transferring water rights through the use of markets is a potentially important option for dealing with scarcity. Some of the motivations for moving to such a markets 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 (such as pricing and cap and trade systems) in environmental management and public policy, such as the sulfur dioxide (SO_2) "cap-and-trade" system which reduced acid rain in the Northeastern United States;
- Other jurisdictions, such as Australia and western US states, with roughly similar legal and institutional structures, having moved to greater use of water markets to address scarcity;
- Political motivations such as using voluntary transfers to change allocations thus removing regulators from the role of imposing reallocations, and shielding politicians from the results of bureaucratic restrictions; and,
- Communities and watersheds, especially in the dry prairies and western provinces of Canada, facing problems with over allocation of water and the inflexibility of existing allocation systems in the face of long term water scarcity.

Effective resource allocation reform requires establishing the limits of human water use, a critical *social* decision, through instream flow analysis, hydrological sciences, and transparent and 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.

Formal markets may be most needed to deal with trades that go beyond the local community, trades that are long term, and trades that occur between (rather than simply within) sectors with more far-reaching third party effects. Informal markets may be most likely to develop within geographically confined areas and amongst community members and perhaps

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[21] H. Bjornlund, *Formal and Informal Water Markets: Drivers of Sustainable Rural Communities?* (2004) *Water Resources Research*, 40.

between members of water use associations.[22]

(a) The broader policy context

While markets may be effective at moving water around between different uses,[23] they must be carefully phased in as part of a larger integrated water resource management strategy. 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."[24]

Australia, South Africa and the European Union situate 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.[25]

In Australia, separation of water entitlements from the property right in land and complementing encouragements to promote trading in water entitlements, was launched by the Council of Australian Governments (CoAG) in 1994 as part of a broad water framework. This CoAG initiative includes institutional reforms, consultation and public education, and specifically acknowledges the environment as a legitimate user of water.[26]

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22 N. Bankes, *The legal framework in Alberta for acquiring water entitlements from existing users* (2006) *Alberta Law Review*, 44, 323-76.

23 H. Bjornlund, *Formal and Informal Water Markets: Drivers of Sustainable Rural Communities?* (2004) *Water Resources Research*, 40.

24 S. Postel & B.D. Richter, *Rivers for Life: Managing Water for People and Nature* (Washington, DC: Island Press, 2003).

25 Water Policy in the European Union, Communication on Water Scarcity and Droughts. European Union, Environment. Retrieved from <http://ec.europa.eu/environment/water/quantity/scarcity_en.htm>.

26 Council of Australian Governments, *Communique* (1994). Meeting of CoAG in Hobard; H. Bjornlund, *Water Scarcity and its Implications for Land Management: Some Lessons*

In Canada few provinces have produced a comprehensive water strategy that includes water markets. Alberta is the exception and is the sole province with a formalized market transfer system. This innovation 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.[27]

(b) Overview of Water Markets and How They Function

A water transfer can be defined in different ways. 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."[28] 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. For example, permanent transfers of water rights are possible but so are temporary options, such as leases or future options without exchange of ownership.[29]

(i) *Basic market requirements*

A number of basic elements must be present for markets to function:

1. 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; and,

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from Australia (London: Royal Institution of Chartered Surveyors, 2008) 9.

27 <http://www.waterforlife.gov.ab.ca/>.

28 N. Bankes, *The Legal Framework for Acquiring Water Entitlements from Existing Users* (2006) *Alberta Law Review*, 44 (2), 323.

29 J. Brewer, R. Glennon, A. Ker & G. Libecap, *Transferring Water in the American West 1987-2005* (2007) *Michigan Journal of Law Reform*, 40, 1021.

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.

(ii) *What is transferred*

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

Drawing a parallel to the property market, the entitlement markets 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.[30]

(iii) *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 (license) holders like a water bank, water trust, or a government agency. Water banks in some cases have also been a buyer of water for in-stream purposes and not necessarily an administrator of the market.

(c) Government and the Regulatory Role

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30 H. Bjornlund, *Water Scarcity and its implications for land management: some lessons from Australia* (London: Royal Institution of Chartered Surveyors, 2008).

In a perfectly competitive market, willing buyers and sellers meet to exchange water or water rights with an equilibrium price that reflects all the values put on water. Thus 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 were a standard commodity, free-market allocation of resources would be efficient and little attention to the policy context or regulation would be necessary.[31] This only happens in text books and theory.

Although implementing markets could in principle reduce state intervention, particularly in determining who can access water, the state still has to intervene. For example, the state may determine the total amount of water that can be traded or may organize trading to ensure environmental and/or other social goals are met. 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."[32]

The government 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, as part of an in-depth review of water markets recently noted: "Inventiveness and fine tuning comes from people on the landscape."[33]

(i) *Significant roles for regulators in water markets*

Practitioners interviewed as part of the research report noted several significant roles for regulators in creating the organizing framework in which market principles may function

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31 H. Chong & D. Sunding, *Water Markets and Trading* (2006) *Annual Review of Environmental Resources* (31), 239-64 at 242.

32 J.W. Dellapenna, *Markets for Water: Time to Put the Myth to Rest?* (2005) *Journal of Contemporary Water Research & Education*, 131, 33-41.

33 D. McGee, interview, April 10, 2008 in O.M. Brandes, L. Nowlan, K. Paris with R. Wilts *Going with the Flow? Evolving water allocations and the potential and limits of water markets in Canada* (Ottawa, ON: Conference Board of Canada, 2008).

including:[34]

- 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.[35]

There is a strong argument that allowing water rights transfers to proceed with little or no government oversight has the potential to undermine the confidence in the market itself. The first large-scale water transfer in the Western United States 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 which had attached water rights. It is generally accepted that the City's heavy-handed tactics significantly undermined water markets in California.[36]

(d) Water rights transfers—benefits, risks and safeguards

Recognizing that the success or failure of water markets to achieve environmental along with social goals is a function of the institutional, cultural, and legal context within which they are introduced. The following table summarizes some of the benefits, and risks and limitations associated with using markets for water rights transfers. The complexity of balancing these benefits with the risks is exactly what makes decisions about whether or not to pursue water markets difficult.

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34 O.M. Brandes, L. Nowlan, K. Paris with R. Wilts *Going with the Flow? Evolving water allocations and the potential and limits of water markets in Canada* (Ottawa: ON: Conference Board of Canada, 2008).

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

36 G.D. Libecap, *Chinatown: Transaction Costs in Water Rights Exchanges. The Owens Valley Transfer to Los Angeles* (June 19, 2005) ICER Working Paper Series No. 16-2005. Retrieved from <http://ssrn.com/abstract=761764>.

TABLE 1: Markets and Water Rights Transfers Overview

Potential Benefits	Risks and Limitations	Basic Safeguards Needed
Improves flexibility and resiliency of existing allocation system by increasing responsiveness to changing seasonal, economic, social and environmental conditions.	Markets are only one option of many and require careful consideration and significant attention to institutional design and governance. Once markets are created, it is very difficult to undo or withdraw rights associated with the ability to transfer without significant compensation. Elevated potential for market failures due to inadequate information, purchasing power imbalances between water users, insufficient buyers or sellers, and social and environmental externalities. Potential high transaction costs, including costs of negotiating trades, information provision and physically conveying transferred water.	Should only be considered in areas with existing prior allocation systems and with appropriate institutional "infrastructure" in place to ensure protection of the public good, including: • definition of property rights/entitlements; • low transaction costs; • full transparency; • public participation; • competition; • no significant power imbalances (including monopolization protections); • detailed water use monitoring; and, • provisions to ensure compliance with the conditions of the transfers.
Provides incentives for water efficiency and stimulates innovation to save water through new technologies or practices.	Environmental effects of trading may be hard to predict with unintended consequences including: • reduced return flows (or an increase in consumption by the transferee), leaving less water in the stream for other appropriators; • transfers of seasonal rights may change the timing of diversions to a high demand period and may also change the total amount diverted; and, • degradation of water quality "Sleeper" or "dozer" rights—rights that have not been fully used—may become activated increasing the intensity of use once traded	Establish *apriori* ecological limits of withdrawals that account for basic Instream Flow Needs (IFNs) (with a precautionary buffer). Thus setting a cap or the bounds within which trades can occur. These pre-established limits must be set in law to ensure enforceability Mandate detailed publicly accountable watershed planning that establishes ecological limits and within which trading system is to be situated and require water use plans proving best management practices Separate consumptive uses from withdrawal uses (with return flows) and limit trades to historically use (not licensed use) Trade in *shares* (% of consumptive pool) instead of *volumes* (actual litres) thus increasing flexibility as water availability fluctuates year to year.
Increases economic productivity as water moves from "low" to "high" value uses	Social and environmental priorities may not be reflected in market outcomes, (e.g., shifting water out of agriculture into non-essential uses, such as golf courses and casinos). Cumulative impacts of multiple transfers	Regulatory oversight and approval system with clear criteria in place, that includes: • 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

	out of less-productive agricultural regions may trigger economic crisis of those communities and irrigation districts, and compromise integrity of soils. Shifting water out of supply systems may increase operation and maintenance cost for remaining irrigator.	appropriate, arranging compensation; and, • access to adequate information (e.g. posting of trades and prices), public participation rights and access to justice mechanisms. Spatial (i.e. watershed) restrictions to trade. Provide adjustment assistance to affected communities
Increases water availability for new users in water-constrained systems, enhancing social resilience as markets provide signals and can facilitate adaptation to changing or unexpected circumstances	Risk of de facto privatization of water resources, in which private benefits trump socially optimal uses. Difficulty of effectively managing timing of diversions, local ecological issues that result from changing patterns of flow.	Must be part of broader water governance reform that emphasizes an ecosystem-based management (ESBM) approach. Mechanisms to avoid "trading into future trouble" for example by taking a holistic full scope view (environmental and social) of impacts of the traded rights.
Voluntary process by relying on willing buyers and sellers, takes regulators out of decision making on reallocation and de-politicizes scarcity decisions	Inadequate protection for traditional unregistered users, such as aboriginal users. Speculation and market concentration (water barons) Reduces potential for setting social priorities	Provide clear enforceable and transferable property rights. Clear and low cost dispute resolution mechanisms—something beyond current courts or processes with restrictive standing requirements. Limits on ownership
Provides a new opportunity for agriculture to diversify income streams by trading water and may increase overall economic health of the sector.	Opportunity costs may lead to substitution of less regulated sources (such as groundwater) for tradable surface rights, exacerbating existing concerns about over reliance on groundwater.	Water allocation system must be fully integrated, accounting for ground-surface water connections and link quality concerns (such as source and waste water).
Provides new opportunities for conservation by potentially allowing third parties (such as government or conservation groups) to enter into water market specifically for conservation purposes, especially in closed systems.	Requires extra financial contribution from third parties to protect a public resource which should not be overallocated in the first place.	Full access so that conservation groups and the government itself should be able to participate as buyers in market.
Increases broader	This should be a societal priority immaterial	Senior government must provide clear

societal scrutiny of (and engagement in) current systems of water use and management	of whether markets for water are being considered.	leadership and direction on priorities related to water management enabling local solutions that ensure ecosystem protection and broad societal engagement.

Source *Brandes et al. (2008)*

In addition to outlining the risks and benefits associated with water markets, this summary also proposes instituting basic safeguards to ensure that markets can play a beneficial role in achieving the desired environmental and social objectives.

Many of these safeguards—careful and transparent planning and management; measurement of water uses; enforcement of water rights; appropriate dispute resolution procedures; integrated watershed-based ecosystem management; and, public participation in decision making and regulatory oversight—are applicable to any significant water governance reform. In the context of water markets where there are increased risks of unintended consequences such as activation of dormant rights, increased intensity of use and irreversibility without significant compensation, it is even more critical to ensure "good" water governance is in place.

To take one example, transferable water licenses may expand the regulator's toolbox to help address the ongoing problem of diminished instream flows and compromised fish habitat by creating opportunities for "instream" acquisitions by government or water trusts. But unless there are clear water rights, and transparent rules for how these transfers will work that clearly delineate who can participate in the decisions surrounding the transfers, such transfers are unlikely to be effectively used due to perceived potential controversies and uncertainties, and so achieving gains in flows for ecosystems may not materialize. However, with the suggested safeguards in place, these transfers are more likely to be used to achieve the desired ends. Yet the point remains that markets alone will simply not ensure environmental benefits or ecologically sustainable outcomes.

The need for the various safeguards and protections outlined here emphasizes the importance of considering introducing water markets only in the context of extensive water governance reform and with appropriate institutional, human and financial commitments by government.

4. CONCLUSIONS AND CONSIDERATIONS FOR GOING FORWARD

> "The international literature suggests that water markets can work if the policy space is bounded by appropriate constraints. In California, for example, where they have dynamic public trust legislation in place and working, the power of the free market has done a very good job of moving water to higher valued uses and creating efficiencies. But, in other places in the world, for example some places in South America where they didn't have appropriate constraints in place, it has been a disaster."[37]
>
> Ralph Pentland quoted in
> *Going with the Flow? Evolving water allocations*
> *and the potential and limits of water markets in Canada.*
> Conference Board of Canada

Though a system of transferable water licenses is now beginning to function in Alberta, the widespread introduction of similar systems across the country is unlikely due to the nature of water supplies and the outdated provincial and federal water laws that govern the resource.

Water markets are not a panacea to correct past management deficiencies, remedy the problem of over allocated systems, or solve important policy (and ultimately political) decisions. Markets are not sufficient to address the problems of water scarcity. As the World Business Council on Sustainable Development notes: "Business cannot buy its way out of water problems."[38]

Although there are potentially a number benefits associated with the use of market principles, as a tool they are only appropriate in certain narrow situations, such as in cases of prior allocation systems with ongoing water scarcity and where there is a firm commitment to establishing the appropriate governance "infrastructure" and institutions to ensure good management and appropriate oversight. 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.

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37 O.M. Brandes, L. Nowlan, K. Paris with R. Wilts *Going with the Flow? Evolving water allocations and the potential and limits of water markets in Canada* (Ottawa, ON: Conference Board of Canada, 2008).

38 *Business and the World of Water—WBCSD Water Scenarios to 2025* (Geneva: World Business Council on Sustainable Development, 2006).

This research demonstrates that a great deal more thought is needed before Canadian jurisdictions wade into the uncertain waters of water markets. In particular Canadian policy makers and stakeholders should begin a national dialogue to explore what kind of role of markets should play in water allocation and reallocation and policy analysts and decision makers must increase our collective understanding of the range of policy alternatives available. If we do opt to more aggressively pursue and experiment with water markets we must ensure clarity of the international trade law implications surrounding trading water rights and clear ground rules must be established before wide scale implementation.