

The Right and Wrong Ways to Manage Water: Lessons from Spectrum and Australia

At the Colorado Capitol, it is inscribed on the walls: “*Here is a land where life is written in water.*” On one level, it’s that simple—water is intricately connected to our Colorado way of life. That’s why the suggestion that private investors can take complete control of our destiny through speculation and an open market bidding system on water rights demands careful reflection—and appropriate skepticism.

As we consider the future of water law and policy, I wanted to start with an examination of a different limited natural resource—the wireless spectrum. And I can speak to this case study from personal experience, as I have evaluated how to regulate wireless spectrum through scholarly research and as Senior Advisor to the White House’s National Economic Council Director.¹ After discussing this case study, I will examine the case of water markets in Australia and then return to an evaluation of the lessons for water law and policy here in Colorado.

I. What Spectrum Can Teach

The wireless spectrum presents an instructive case for understanding the opportunities and limits of property rights. Like access to water, most people take the use of the wireless spectrum for granted—even though they rely on it for a range of economic and social activities. We use the wireless spectrum, also known as “radio frequencies,” for our mobile phones, Wi-Fi networks, GPS devices, terrestrial and satellite TV, air traffic control systems, public safety communications systems, and even garage door openers. But as economists long have explained, the allocation, assignment, and use of wireless spectrum is hardly a model of how to ensure the efficient use of this valued and limited resource.²

The challenge for modern spectrum policy is to determine what radio frequencies should be made available for those who can pay the most for them and what frequencies should remain outside market evaluation. Consider, for example, that if forced to bid on the open market for the relevant radio frequencies, a considerable number of users—including: (1) satellite providers who enable distant territories to have connectivity; (2) global positioning system (“GPS”) communications; (3) public safety communications; and (4) over-the-air television—might well be unable to operate economically. Thus, two critical questions for Congress and the U.S. Federal Communications Commission (“FCC”) are (1) what radio frequencies should be dedicated to uses

¹ For a sampling of my work on this topic, see e.g., Dale N. Hatfield & Philip J. Weiser, *Spectrum Policy Reform and the Next Frontier of Property Rights*, 15 GEO. MASON L. REV. 549 (2008), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1097391; Phil Weiser, *The Untapped Promise of Wireless Spectrum*, in BROOKINGS INST. HAMILTON PROJECT (2008), https://www.hamiltonproject.org/papers/the_untapped_promise_of_wireless_spectrum; J. Pierre de Vries & Phil Weiser, *Unlocking Spectrum Value through Improved Allocation, Assignment, and Adjudication of Spectrum Rights*, in BROOKINGS INST. HAMILTON PROJECT (2014), https://www.hamiltonproject.org/papers/unlocking_spectrum_value_through_improved_allocation_assignment.

² See NETWORKING AND INFO. TECH. RSCH. AND DEV. PROGRAM, PROMOTING ECONOMIC EFFICIENCY IN SPECTRUM USE: THE ECONOMIC AND POLICY RESEARCH AGENDA (2013), https://www.nitr.gov/pubs/WSRD_Workshop_IV_Report.pdf.

other than that of the highest bidder; and (2) how can frequencies, once initially allocated, be reallocated when circumstances change.³

In 2012, Congress enacted a landmark spectrum law that enabled a more efficient use of wireless spectrum and empowered the FCC to oversee that transition of spectrum rights from incumbent broadcast television providers to wireless telecommunications firms while protecting the public's interest in the resource.⁴ In that law, Congress provided for a one-time opportunity to auction off up to 120 Megahertz of spectrum—the equivalent of 20 TV stations.⁵ Before the law took effect, the TV “dial” could accommodate over-the-air channels from 2 to 51; after the implementation of the law, a total of 15 channels were freed up so that the over-the-air TV broadcasting only went up to channel 36. This allowed 15 relatively low-value TV channels—and the equivalent of 84 Megahertz of spectrum—to be converted to much higher value wireless services, aligning the public interest with market forces.

The transition called for in the 2012 law reflected important technological changes since the original allocation of spectrum for over-the-air TV. For starters, the law recognized that the vast majority of Americans were no longer watching TV over-the-air, but instead were taking advantage of cable, satellite, or online options. Moreover, the advent of digital broadcasting increased transmission capacity so that what used to be a single channel could now carry six channels; this multi-casting opportunity allowed some of the channels that sold their legacy radio frequencies to remain over-the-air broadcasters through agreements with those stations who remained on the air.⁶

That 2012 law reflected a great deal of bipartisan work and underscored that rigorous analysis can and does inform public policy reforms. When he championed this initiative as the director of the White House National Economic Council, Lawrence Summers explained that:

Opening up spectrum will create the foundation for new private sector investment and economic activity – in mobile broadband and a range of other high-value uses – that would not have been possible without the coordinating and organizing role of government.⁷

Importantly, the initiative also included support for the dedication of additional spectrum to public safety as well as an investment in next generation technology for an interoperable wireless broadband network optimized for public safety.⁸

³ This question is also complicated on a technical level because not all uses of the radio waves are compatible with one another—for example, high powered public safety communications and low powered wireless telephone service present the risk, if operating adjacently to one another, of interference. This issue is discussed in Hatfield & Weiser, *supra* note 1, at 557.

⁴ What is now known as the Spectrum Act is included in Title VI of a larger bill. *See* Middle Class Tax Relief and Job Creation Act of 2012, Pub. L. No. 112-96, 126 Stat. 156, 201.

⁵ *See id.*

⁶ *Digital Television*, FCC (last updated: Aug. 9, 2016), <https://www.fcc.gov/general/digital-television>.

⁷ Lawrence H. Summers, Director, White House Nat'l Econ. Council, Remarks at the New Am. Found. on the President's Spectrum Initiative: Technological Opportunities, Job Creation and Economic Growth (June 28, 2010); http://larrysummers.com/wp-content/uploads/2015/07/Technological-Opportunities_6.28.2010.pdf.

⁸ As the White House Fact Sheet explained, “a critical part of this spectrum initiative will be to provide funding to help build a nationwide interoperable mobile broadband network for public safety. This network would include

An important lesson from spectrum policy is that through rigorous analysis that takes account of a range of perspectives and leverages technological changes, we can promote better public policy solutions that are not partisan, fairly consider all stakeholders, and are forward looking. This can be a challenge in public policymaking when some stakeholders have far more effective lobbying machines than others. To achieve this goal, we are well served by Governor Roy Romer’s powerful observation that “all truth is partial.” The point from former Colorado Governor Romer is that, when looking at complex public policy issues, we should start by asking others how they are viewing the issue and learn from their perspectives. Unfortunately, when policymakers fail to do so—as captured by the Australian water case study—poor results may follow.

II. Australia’s Water Experience

Like spectrum, regulation of water should be driven by rigorous analysis and a commitment to promoting the overall public health and safety. Like the wireless spectrum, which is essentially fully allocated, new or changing uses for water may well require transfer of existing rights. As the Australia case underscores, the impact of the structure of the regulatory regime and how it governs markets makes an extraordinary difference.

Legal regimes provide relevant guardrails for how markets operate, including ones that address transparency, possible manipulation, and anticompetitive conduct, just to name a few. Moreover, where society values certain “public goods” or recognizes “positive externalities,” those values merit protection by law and policy.⁹ As many commentators have reported, the Australian experience demonstrates what can happen to water law and policy when such public interest protections are not built in from the outset.

The Australian government adopted the Water Act of 2007 to “address ‘over-allocation’ of water” in the Murray-Darling Basin, the country’s largest watershed.¹⁰ The new law effectively de-regulated the Basin, allowing authorities to “efficiently allocate scarce water to its most economically valuable use.”¹¹ This free-market system was initially praised as a flexible solution to the problem of divvying up water when it is most scarce – during long and severe droughts.¹² On

“next generation” technologies of the kind already being used by major American enterprises and be tailored to meet public safety’s needs.” Press Release, White House Off. of Press Secretary, Fact Sheet: Doubling the Amount of Commercial Spectrum to Unleash the Innovative Potential of Wireless Broadband (June 28, 2010), <https://obamawhitehouse.archives.gov/the-press-office/fact-sheet-doubling-amount-commercial-spectrum-unleash-innovative-potential-wireless>. Congress adopted this concept into law, creating what became known as the FirstNet initiative. See §§ 6201-13, 126 Stat. 156 at 206-18.

⁹ A public good is one that is open to all to benefit from and cannot be restricted, such as public safety. See *Public good*, Encyclopedia Britannica (Aug. 17, 2015), <https://www.britannica.com/topic/public-good-economics/>; A positive externality is a benefit that extends to third parties beyond the one directly affected, such as how education of citizens benefits not only the individual citizen, but society overall. See Thomas Helbling, *Externalities: Prices Do Not Capture All Costs*, IMF (last updated: Feb. 24, 2020), <https://www.imf.org/external/pubs/ft/fandd/basics/external.htm>.

¹⁰ AUSTL. COMPETITION AND CONSUMER COMM’N, MURRAY-DARLING BASIN WATER MARKETS INQUIRY INTERIM REPORT 16 (2020), <https://www.accc.gov.au/system/files/Murray-Darling%20Basin%20inquiry%20interim%20report.pdf>.

¹¹ *Id.*

¹² See Felicity Barringer, *Divying up the Water Down Under*, N.Y. TIMES (Mar. 21, 2011), <https://green.blogs.nytimes.com/2011/03/21/divvying-up-the-water-down-under/>.

the positive side, the new regime allowed farmers of water-intensive crops like rice and cotton to sell their water to farmers of more drought-resistant produce, such as nut trees or grapes, helping ensure that those crops could be produced during the drought.¹³

When Australia enacted this new regime, it failed to include some of the critical protections discussed above. Consequently, the system hurt a number of farmers, many of whom found themselves struggling to operate in an often opaque and uncertain system. Notably, the benefits from the new system mostly accrued to “the larger, well-informed irrigators at the expense of the smaller ‘family-farm’ operations which are crucial to many local communities.”¹⁴ Moreover, as we witnessed in Colorado counties hurt by wholesale “buy and dry” practices,¹⁵ whole communities in Australia suffered massive economic setbacks. Observing these impacts in practice, the Australian antitrust authority recommended dramatic changes in water markets, calling out a failure of regulatory oversight and the widespread presence of market exploitation.¹⁶

It turns out that the most vulnerable communities are often unable to keep up in a free market system without necessary safeguards. In 2019, another “crippling drought” struck Australia.¹⁷ This time, however, years of mismanagement under the free market system meant there was not enough water to go around. The Australian government, having approved water-intensive mining projects that drastically reduced the country’s supply, was forced to buy \$80 million in water from a private company based in the Cayman Islands just to support its citizens.¹⁸ Still, as a persistent drought and devastating wildfires become the norm, farming families and Indigenous communities, including those who have cared for the land for generations, may well be forced to relocate entirely.¹⁹

Urban and suburban populations in Australia have suffered hardship as well. As reservoirs ran dry, some towns turned to using wells to extract groundwater, but, in some cases, found that their groundwater was contaminated and unsafe to drink.²⁰ Sydney, the country’s largest city, resorted to employing water officers to “educate citizens and enforce restrictions” on individual water usage.²¹ And in Melbourne, government officials have ruled out building more dams to provide water to the surrounding rural areas since river flow serving the city is “expected to drop by half by 2065.”²²

¹³ See *id.*

¹⁴ Anthony S. Kiem, *Drought and water policy in Australia: Challenges for the future illustrated by the issues associated with water trading and climate change adaptation in the Murray-Darling Basin*, 23 GLOB. ENV’T CHANGE 1615, 1624 (2013), <https://www.sciencedirect.com/science/article/pii/S0959378013001581>.

¹⁵ For a discussion of this concept, and how it had an impact on Crowley County, see Robert Sanchez, *High + Dry*, 5280 (2014), <https://www.5280.com/crowley>.

¹⁶ See MURRAY-DARLING BASIN WATER MARKETS INQUIRY INTERIM REPORT, *supra* note 10. <https://www.accc.gov.au/system/files/Murray-Darling%20Basin%20inquiry%20-%20interim%20report.pdf>.

¹⁷ Livia Albeck-Ripka, *As Water Runs Low, Can Life in the Outback Go On?*, N.Y. TIMES (Dec. 9, 2019), <https://www.nytimes.com/2019/12/08/world/australia/water-drought-climate.html>.

¹⁸ Kath Sullivan, *Labor demands answers on \$80 million Murray-Darling Basin water buyback deal as Joyce fires back*, ABC NEWS (Apr. 22, 2019), <https://www.abc.net.au/news/2019-04-22/labor-demands-answers-on-murray-darling-water-buyback-deal/11035652>.

¹⁹ See Albeck-Ripka, *supra* note 17.

²⁰ See *id.*

²¹ *Id.*

²² *Id.*

One commentator who evaluated Australia’s experience concluded that, in the wake of the development of a market in complex financial products (e.g., derivatives) based on water, the gaming of access to the resource and a lack of access for critical users (small farmers, rural communities, and Indigenous populations) had devastating effects. That’s why Australian professor Stuart Kells regretted how that nation let “the market rip.” In his view, “[w]hat has happened in Australia should be a cautionary tale for America,” explaining that “[t]he way the markets were set up left them open to being gamed.”²³

Studies of Australia’s experiment with water markets suggest how the mismanagement of market design issues along with drought and climate change impacts combined to impose unnecessary hardships on communities ranging from small towns in the middle of the Outback to coastal city centers. Thus, not only did Australia allow private for-profit interests to misallocate water from many who need it, but it did so at great cost, forcing the public treasury to buy costly water so key parts of the country could even survive. In short, poorly governed markets can increase public costs and make resource allocation less efficient.

III. Lessons for Colorado Water Law

Here in Colorado, we face hydrologic conditions similar to those in Australia. Last year, we suffered a record-breaking fire season and Mother Nature doesn’t appear to be relenting. The U.S. drought monitor shows at least 75% of the State in “extreme or exceptional” drought.²⁴ The already low snowpack will likely be reduced even further by predicted warmer and drier than normal conditions over the coming months. We are facing a looming crisis and need to take action.

Just as in Australia, there are those inside and outside Colorado ready to profit from water markets at a time of crisis for our state. As our Colorado Water Conservation Board Executive Director Becky Mitchell put it, “speculation and private investment in water is a growing concern across the state.”²⁵ But Australia teaches us that open markets alone cannot solve the problems we are facing together as a state.

Facing the contemporaneous challenges of decreasing supply and increasing demands requires collaboration and creativity by all of us.²⁶ We need to work together to meet this challenge and to determine how to structure and use water markets in service of our policy goals. If we fail to work together to develop an effective solution, we may be left fighting both amongst ourselves and with surrounding states—to disastrous results.

²³ Ben Ryder-Howe, *Wall Street Eyes Billions in the Colorado’s Water*, N.Y. TIMES (Jan. 3, 2021), <https://www.nytimes.com/2021/01/03/business/colorado-river-water-rights.html>.

²⁴ See *Colorado*, UNITED STATES DROUGHT MONITOR (last updated Jan. 28, 2021), <https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?CO>.

²⁵ Rebecca Mitchell, To protect the Colorado River from drought and speculation, we need to collaborate, DENVER POST (Jan. 13, 2021), <https://www.denverpost.com/2021/01/13/guest-commentary-collaboration-will-protect-the-colorado-river-from-drought-and-speculation-alike/>.

²⁶ See Phil Weiser, Colo. Att’y Gen., Remarks at the Colo. Water Cong. 2020 Summer Conf.: Policy Perspectives on the Future of the Colorado River Basin 5 (Sept. 10, 2020), <https://coag.gov/blog-post/prepared-remarks-policy-perspectives-on-the-future-of-the-colorado-river-basin-9-10-20> (“We are living during a time when we can proactively and collaboratively investigate how to best protect Colorado interests, minimize impacts to water users, and create benefits for all stakeholders while maintaining Compact compliance.”).

As charged by the General Assembly, the Attorney General’s Office is part of a work group now analyzing concerns related to water speculation and how water law and policy should respond. The work group created by the General Assembly is comprised of farmers, ranchers, municipal providers, conservation groups, state agencies, and others representing water districts, tribal interests, and more.²⁷ It includes members from every major river basin around the state because we, as a state, must face our challenging future together. We will also work to ensure robust public input and are committed not to let particular groups dominate the conversation. Every voice must be heard and every tool considered.

In Colorado, we are facing a looming challenge driven by climate change—and its impact on our water supply—and a rising population. A core question we must face is, if we are unable to meet our obligations to other states under interstate compacts like the Colorado River Compact and its operative guidelines, how do we respond? The basic response to such a situation is to implement a Compact-driven curtailment, rolling back rights to use water by priority level. This step, however, is a complex and challenging undertaking.²⁸ It is thus in our collective interest to determine if there are available tools we might use to avoid this outcome.

One of those potential tools is demand management. This effort could involve paying water users to forbear the use of their water on a temporary basis and use the conserved water to protect the state and its water users against mandatory curtailment. At present, the demand management tool is one we are investigating to address Compact compliance on the Colorado River. If not managed carefully, however, such a system could be open to abuse and manipulation. By contrast, if managed effectively, like the double-sided spectrum auction, this tool could catalyze innovation and the more effective use of this precious resource without resorting to mandatory curtailment. That innovation could apply in situations beyond the specific case of Colorado River Compact and could assist Colorado in the most-informed approach to managing a changing water market. Indeed, the Rio Grande Water Conservation District is also using similar techniques to manage its depleted aquifer levels.²⁹

Other tools for managing our water include conservation, re-use, storage, and innovative sharing arrangements. In the Colorado Water Plan, conservation of water use plays an essential role. Last year, voters around the state provided funding for implementation of the Water Plan—supporting such efforts—by passing Proposition DD to legalize and tax sports betting. While modest, it is a start. We must use that funding to double down on existing efforts to harness our ingenuity and innovation to find new ways to conserve water. This can include, for example, supporting work by farmers to shift to profitable crops—like hemp—that use less water. Investing in agricultural opportunities that are more resistant to drought must be a priority of ours.

²⁷ See COLO. REV. STAT. ANN. § 37-98-103(8) (West 2020).

²⁸ See Weiser, *supra* note 26, at 5 (“Compact administration if accomplished by curtailment only is a blunt instrument that is likely to have significant negative impacts statewide and may not be the best option for our state.”).

²⁹ See Nick Bowlin, *Colorado farmers fight to save their water and their community’s future*, HIGH COUNTRY NEWS (Sept. 16, 2019), <https://www.hcn.org/issues/51.16/water-colorado-farmers-fight-to-save-their-water-and-their-communitys-future> (“Western water wonks mostly view this attempt at self-management with hope, as a possible model for other communities facing water crises.”).

As for water re-use, we can learn from other countries—like Israel—that have used such opportunities to great effect.³⁰ And thanks to leadership of Representative Jeni Arndt and others, we now have increased legislative tools to do so. With respect to increased storage, the need for more smart storage is plain—with less natural snowpack alternative storage arrangements must be used to compensate, giving us more flexibility to manage during increased weather variability.

Alternative sharing arrangements offer an opportunity to create win-win opportunities. Notably, reasonable transfer arrangements give the opportunity for communities to allow managed cutbacks in water use by farmers that can be put to other uses—say, planting every-other-year or accepting financing to change to crops that require less water. Such changes, in contrast to wholesale “buy-and-dry” scenarios, still enable those communities to be supported and water rights to remain in the hands of communities that rely on them. These policies also recognize the value of continuing agriculture here in Colorado, keeping local sources of food available, and preserving long valued traditions.

Among those long-valued traditions we must preserve is the quality of our water. The importance of water to the environment, our recreation industry, and the health of our citizens cannot be overstated. That’s why we are fighting to preserve the 2008 Waters of the United States Rule, which provides a reasonable balance of water quality protection and freedom to operate by farmers and others. Those rules also preserve state sovereignty to administer and distribute the waters of the state, thus ensuring that our own control of water quantity is not compromised in the name of federal oversight of water quality.

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As we go forward, it is important to recognize how water rights impact a great number of individuals and communities in profound ways. This means that our efforts to meet current challenges require planning, honest and transparent discussions of different options, and a keen awareness of potential consequences. As part of Colorado’s leadership team working on this issue, I can assure you that we are committed to all of the above and to protecting our most important nature resource.

³⁰ See Karyn Simpson, *What the world can learn from Israel’s water reuse programs*, MEDILL REPORTS (Oct. 18, 2018), <https://news.medill.northwestern.edu/chicago/what-the-world-can-learn-from-israels-water-reuse-programs/>.