The Problem of Reallocation in a Regulated Riparian System: Examining the Law in Georgia

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NOTES

THE PROBLEM OF REALLOCATION IN A REGULATED RIPARIAN SYSTEM: EXAMINING THE LAW IN GEORGIA[1]

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[1] This Note continues the work of a note published in the Georgia Law Review in Spring 2004. *See* John L. Fortuna, Note, *Water Rights, Public Resources, and Private Commodities: Examining the Current and Future Law Governing the Allocation of Georgia Water*, 38 GA. L. REV. 1009 (2004) (summarizing current law of Georgia water allocation and use).

I. INTRODUCTION

At the height of a severe drought during the late 1990s, the Georgia Environmental Protection Division (EPD) placed a moratorium on new water withdrawal permits in coastal and southwest Georgia because of fears that water use in these regions had outstripped supply.[2] This moratorium, and the subsequent clamor for additional water supply,[3] provided the impetus for the introduction of controversial water marketing legislation during the 2003 Session of the Georgia General Assembly. Proponents of permit trading argued that a market would enable economic growth, allow for a fair reallocation of permits among users, and facilitate conservation through increased efficiency of water usage.[4] Opponents argued that markets were an inappropriate way for Georgia to introduce economic incentives into water management. They claimed that the state would lose control over water resource management, that the sale of unused capacity in the permit system would overburden water resources, and that market allocation would be ethically unfair.[5] As a result of widespread opposition to permit trading,[6] the controversial bill was voted down just before midnight on the final day of the 2003 legislative session.[7]

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[2] *See* ENVTL. PROT. DIV., GA. DEP'T OF NATURAL RES., GEORGIA'S ENVIRONMENT 2003, at 6-9 (2003), http://www.dnr.state.ga.us/dnr/environ/ (listed as "Environment Report") (discussing water supply problems in coastal and southwest Georgia).

[3] *See* Paul L. Hollis, *Water Issues Refuse to Go Away*, SOUTHEAST FARM PRESS, Apr. 4, 2001, http://southeastfarmpress.com/mag/farming_water_issues_refuse/ ("After a deadline of Nov. 31, 1999, was announced for applying for new irrigation permits, the DNR was deluged with more than 2,700 applications over a 60-day period . . . .").

[4] *See* GA. PUB. POLICY FOUND., WATER PERMIT TRANSFERS: BRIDGING THE MISINFORMATION GAP 14-17 (2003), http://www.gppf.org/pub/Water/waterpermittransfers_2.pdf (presenting hypothetical model of permit trading).

[5] *See* Joseph W. Dellapenna & Stephen E. Draper, Straight Talk about Markets for Water 1 (Water Issues White Paper, 2003), http://www.cviog.uga.edu/services/policy/environmental/georgiacommittee/whitepapers/markets.pdf (arguing against markets); Fortuna, *supra* note 1, at 1051-63 (discussing constitutional, economic, and social implications of water markets).

[6] As of November 11, 2004, 177 county and local municipal governments in Georgia, representing more than 52% of the state's population, had passed a resolution opposing permit trading. Ga. Water Coal., List of Local Gov'ts Opposing Permit Trading, http://www.gwf.org/gawater/cityresolutions.html (last visited Sept. 15, 2005).

[7] *See* Stacy Shelton, *Water Bill Left for Final Hours*, ATLANTA J.-CONST., Apr. 25, 2003, at C5 ("The most controversial environmental legislation, perhaps in Georgia's history, was

This dispute over water marketing highlights one of the unsolved problems of a water permit system: reallocation of water to higher valued uses when additional supply is no longer available.[8] Because permits are allocated to new users as uses arise—in effect, a first come first serve basis—the initial allocation is unlikely to be optimal in the long run.[9] As long as additional water capacity remains available, the administering agency can continue to issue permits to new users, and conflicts will not develop. This approach has worked well for eastern states in general, where water shortages have traditionally been rare and short-lived.[10] Georgia, for example, is a water-rich state where, until recently, supply almost always exceeded demand.[11]

Once the resource becomes fully allocated, as it may already be in parts of Georgia,[12] there will be a need to reallocate water rights to the highest valued uses in order to obtain the most efficient usage of a scarce resource. In regulated riparian states, however, there is usually no mechanism for existing permits to be transferred to other uses in situations where additional permits can no longer be issued.[13] Though this problem may have been mitigated in Georgia by the ending of the drought in 2003, continued growth throughout

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left in the balance for the session's final hours today."); Kristen Watt, *Georgia Left With No Water Plan After Bill Falters*, SAVANNAH MORNING NEWS, May 5, 2003, at 1A (describing collapse of comprehensive water bill over permit trading provisions); Dave Williams, *House Shoots Down Water-Permit Trading*, SAVANNAH MORNING NEWS, Apr. 27, 2003, at 1B (describing defeat of controversial proposal shortly before midnight in one of final votes of 2003 session).

[8] *See* Joseph W. Dellapenna, *The Law of Water Allocation in the Southeastern States at the Opening of the Twenty-First Century*, 25 U. ARK. LITTLE ROCK L. REV. 9, 37 (2002) (discussing problems of regulated riparianism in relation to private values).

[9] *See* Richard Ausness, *Water Rights Legislation in the East: A Program for Reform*, 24 WM. & MARY L. REV. 547, 584 (1983) (explaining origin of need for transferability); Joseph W. Dellapenna, *Regulated Riparianism*, *in* 1 WATERS AND WATER RIGHTS § 9.03(d), at 9-115 (Robert E. Beck ed., 2001) (same).

[10] *See* Dellapenna, *supra* note 8, at 9-10 (discussing divergent development of eastern and western water law).

[11] GA. JOINT COMPREHENSIVE WATER PLAN STUDY COMM., FINAL REPORT 3 (2002), http://www.cviog.uga.edu/services/policy/environmental/georgiacommittee/report_final.pdf.

[12] *Cf.* Mary Landers, *New Permits Likely, but No Free-for All*, SAVANNAH MORNING NEWS, Aug. 6, 2005, at 1C (discussing initial results from Sound Science study of saltwater intrusion into Floridan aquifer on Georgia coast).

[13] *See* Dellapenna, *supra* note 8, at 37 (discussing unsolved problems of regulated riparianism). *See generally* Dellapenna, *supra* note 9, § 9.03(d) (discussing transfers to other uses).

the state, and in eastern states in general, will make this a recurring issue for all states that have adopted a regulated riparian permit system.[14]

The debate over allocation has often been framed as a dichotomous choice between having a water market or not having a water market.[15] This Note argues that this is a false choice, partly because there are a range of market institutions available and partly because there are reallocation alternatives that do not involve markets.[16] Most western states, under an appropriative rights system, have fully embraced the concept of water as private property and encourage market trading.[17] Most eastern states, in contrast, manage water through permit systems and provide no mechanism for water rights transfers.[18] The literature on water reflects this dichotomy. A great majority of the research adopts a position that a market is either a panacea for reallocation or a disaster to be avoided at all costs. Less research acknowledges that there are some situations where a market may be effective and other situations where a market would be ineffective or possibly harmful.

Not only does this Note adopt a nonideological position regarding water markets, it also seeks to consider a range of possible reallocation mechanisms: some market, some nonmarket, and some hybrid. The key message is that the type of allocation problem should dictate the discussion of possible institutional solutions. Georgia must identify problems by region and make policy decisions on reallocation based on specific supply objectives. Although detailed consideration of every possible reallocation mechanism is beyond the scope of this Note, a general discussion of three fundamental approaches is given.

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[14] Eighteen states, primarily east of the Mississippi River, have adopted regulated riparian systems. Dellapenna, *supra* note 8, at 32.

[15] *See* RAY CHALLEN, INSTITUTIONS, TRANSACTION COSTS AND ENVIRONMENTAL POLICY, at xiii (2000) (encouraging extensions of institutional theory in context of Australian water policies).

[16] *See infra* notes 63-93 & 184-215 and accompanying text.

[17] Owen L. Anderson et al., *Reallocations, Transfers and Changes*, *in* 2 WATERS AND WATER RIGHTS, *supra* note 9, § 14.04(a) (noting that transfers are authorized by statute in all prior appropriation states).

[18] Dellapenna, *supra* note 9, § 9.03(d).

Reallocation mechanisms can be classified into three categories: 1) reallocation by administration, 2) reallocation through privately generated incentives, or 3) reallocation through state-based incentives.[19] When a water resource is fully allocated, existing uses must be reduced before allocation to new uses can occur. Because a user will not voluntarily surrender a permit without incentive to do so, there must be a mechanism to accomplish the surrender of an existing water right. First, a state administrative agency may impose an involuntary reduction on a water user by either revoking the permit or by modifying the withdrawal capacity. Second, a prospective user could provide an incentive for an existing permit holder to voluntarily surrender the permit or reduce withdrawal.[20] Third, the state could provide the incentive to reduce withdrawal for the purpose of reissuing that water capacity to someone else. This Note offers an explanation and comparison of these three categories of reallocation mechanisms.

Because this Note considers the problem of water reallocation from a global perspective, a full exploration of all subissues is beyond the scope of the discussion. Uncertainties such as the nature of private property rights in water permits and constitutional limitations on state regulatory power are mentioned but are not fully analyzed.[21] The distinction between surface water allocation and groundwater allocation is given only cursory treatment, although statutory comparisons are made in the footnotes.[22] Only limited use has been made of empirical economic and water-use data, though references are included in the footnotes where appropriate. These subissues are complex problems in themselves which have been, and should continue to be, explored in other research.

One major difficulty in proposing any mechanism for water reallocation in Georgia has been the deficiency of accurate scientific

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[19] *See* Wilson G. Barmeyer, *Water Reallocation in Georgia: If Not a Market, Then What?*, *in* 1 PROCEEDINGS OF THE 2005 GEORGIA WATER RESOURCES CONFERENCE 6, 6-8 (Kathryn J. Hatcher ed., 2005), *available at* http://gwri.ce.gatech.edu/GAConf/Proceedings/2005/Papers/ (index of papers) (summarizing three categories of reallocation institutions).

[20] This could also include current users who have a need for additional capacity, such as a growing municipality.

[21] *See infra* notes 134-82 and accompanying text.

[22] *See infra* notes 64-92 and accompanying text.

information on which to base policy. Lack of information is a problem on many levels. First, especially in southwest Georgia, there is a lack of data measuring agricultural usage because, unlike municipal and industrial users, agricultural users have not been required to meter water usage.[23] Second, there is uncertainty as to the consumptive and nonconsumptive properties of various uses.[24] Consumptive use means that no water is returned to the water source after usage, while nonconsumptive use means that water is returned to the source and is therefore available to downstream users.[25] Most uses are partly consumptive and partly nonconsumptive, but the lack of complete scientific information makes it difficult to measure adequately the effect of permit transfers on downstream users.[26] Finally, there is a lack of understanding as to the total amount of withdrawal the natural system can bear and the full consequences of exceeding a safe yield in water withdrawals.[27] Resolving these scientific uncertainties should take priority over introducing major changes to the law of water allocation.[28]

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[23] *See* D.L. Thomas et al., *Agricultural Water Use in Georgia: Results From the Ag. Water Pumping Program*, *in* 2 PROCEEDINGS OF THE 2003 GEORGIA WATER RESOURCES CONFERENCE 566, 566 (Kathryn J. Hatcher ed., 2003), *available at* http://gwri.ce.gatech.edu/GAConf/Proceedings/2003/papers/ (index of papers) (estimating irrigation from two percent of metered agricultural withdrawals). In 2003, the General Assembly passed legislation to begin the process of installing meters on agricultural uses. *See* O.C.G.A. § 12-5-31(m.1)(1) (Supp. 2005) (surface water meters); *id.* § 12-5-105(b.1)(1) (groundwater meters).

[24] *See generally* Stephen E. Draper, Modification of Permits Based on Consumptive Use (Water Issues White Paper, 2002), http://web.cviog.uga.edu/services/policy/environmental/georgiacommittee/whitepapers/consumptiveuse.pdf (discussing importance of considering consumptive uses in permit transfers).

[25] *Id.* at 1.

[26] *Compare* GA. PUB. POLICY FOUND., *supra* note 4, at 9, 14, 16 (assuming agriculture use is 100% consumptive), *with* JOSEPH W. DELLAPENNA, WATER MARKETS AND MISINFORMATION 5-6 (2004) (on file with author) (criticizing that assumption as "[m]isinformation" and "grossly simplifying").

[27] EPD is completing seven-year scientific studies in the Flint River Basin and the Georgia coastal region. Ga. Envtl. Prot. Div., Georgia Flint River Basin Plan, http://www.gadnr.org/frbp/index.html (last visited Aug. 23, 2005); Ga. Envtl. Prot. Div., The Sound Science Initiative: A Scientific Study of Groundwater Use in Coastal Georgia, http://www.gadnr.org/cws/ (last visited Aug. 23, 2005).

[28] At the outset, it is also important to distinguish between allocation of "raw" water and delivery of "treated" water services. Raw water is supply taken directly from the hydrologic system, from a river or a groundwater aquifer. *See* Dellapenna & Draper, *supra* note 5, at 3. Treated water is water that has already been allocated with the hydrologic system, usually to a municipality or utility company. *Id.* This water is later delivered to individual

This Note will discuss possible models for reallocation within a regulated riparian system. Part II begins with a summary of the current law of water permits in Georgia and considers administrative mechanisms for reallocation in the context of EPD's authority to regulate withdrawal permits.[29] Part III continues with an examination of reallocation based on private incentives, namely water markets, and explores the problems presented by permit trading, both in Georgia and generally.[30] Part IV discusses reallocation driven by state-based incentives and describes the recent California Water Bank and the Flint River Drought Protection Act in Georgia.[31] Finally, Part V considers the way forward for Georgia and argues that reallocation solutions must be tailored to achieve specific supply objectives. Because of regional differences in natural water supply and the pattern of human demand, the proper institutional solution should not be "one size fits all" for every corner of the state. Instead, policy solutions should reflect regional supply problems. This underscores the need for regional planning and management in developing a comprehensive statewide water management plan.[32]

II. GEORGIA LAW AND REALLOCATION THROUGH ADMINISTRATION

A. EXISTING LAW IN GEORGIA

The State of Georgia manages large water withdrawals under a regulated riparian and reasonable use permit system.[33] Under this system, water users do not own the actual water,[34] but have the right to make reasonable use of surface water flowing over their

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customers, who pay for the treatment and delivery. Economists often blur the line between the two in advocating for market mechanisms in water allocation. This Note will focus exclusively on allocation of raw water.

[29] *See infra* notes 33-104 and accompanying text.

[30] *See infra* notes 105-83 and accompanying text.

[31] *See infra* notes 184-216 and accompanying text.

[32] *See infra* notes 217-26 and accompanying text.

[33] *See generally* Fortuna, *supra* note 1, at 1030-41 (describing Georgia's management of large water withdrawals).

[34] *See infra* notes 142-51 and accompanying text.

land or groundwater located under their land.[35] Large water withdrawals are regulated by the state through a permit system.[36] In Georgia, any user withdrawing or diverting more than 100,000 gallons per day (GPD) on a monthly average is required to obtain a permit from EPD.[37]

Surface water withdrawals and groundwater withdrawals are regulated under separate statutory regimes: the Surface Water Act and the Groundwater Use Act.[38] Both the Surface Water Act and the Groundwater Use Act apply reasonable use standards to permitted uses.[39] EPD evaluates the reasonableness of the use by applying the criteria established by the General Assembly, including the effects on other users.[40] Nonfarm withdrawal permits are issued for a duration of ten to fifty years.[41]

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[35] *See* Fortuna, *supra* note 1, at 1030-37, 1048-50 (discussing and defending usufructuary properties of common law surface water rights); *id.* at 1037-41, 1045-47 (advocating formal renunciation of absolute ownership doctrine for groundwater to clarify water rights).

[36] *See generally* Fortuna, *supra* note 1, at 1030-41 (discussing Georgia law for large water withdrawals).

[37] O.C.G.A. § 12-5-31(a)(1) (Supp. 2005) (surface water); *id.* § 12-5-96(a)(1) (2001) (groundwater). The permit system only applies to water withdrawals of more than 100,000 GPD. Withdrawals of 100,000 GPD or less are governed by common law riparian rights. *See* Fortuna, *supra* note 1, at 1031-33, 1037-39 (discussing common law riparian rights in Georgia).

[38] O.C.G.A. § 12-5-31 (Supp. 2005) (applying to persons making "withdrawal, diversion, or impoundment" of surface waters); *id.* §§ 12-5-90 to -107 (2001 & Supp. 2005) (applying to persons who "withdraw, obtain, or utilize" groundwater). Georgia law distinguishes between surface water and groundwater, both at common law and under the current statutory scheme for regulatory management. For a discussion of this dichotomy, and an argument that this legal fiction be put to rest due to modern understanding of hydrologic systems, see Fortuna, *supra* note 1, at 1043-47; *see also* Dellapenna, *supra* note 8, at 72 (citing lack of conjunctive management between surface water and groundwater as deficiency in Georgia's management structure, but noting that similarity of statutes and administration by single agency "ameliorates this problem").

[39] O.C.G.A. § 12-5-31(e) (Supp. 2005) (surface water); *id.* § 12-5-96(d) (2001) (groundwater). The statutes apply similar but not identical factors including the number of persons using the water source; the nature, severity, and duration of any impairment adversely affecting availability for other users; the injury to public health, safety, or welfare; the kinds of activities proposed; the importance and necessity of the uses and the extent of any injury caused to other water uses; diversion from or reduction in flows in other watercourses or aquifers; and other relevant factors. *Id.* § 12-5-31(e) (Supp. 2005); *id.* § 12-5-96(d) (2001). Both statutes also expressly consider prior investments in lands and plans for water usage. *Id.* § 12-5-31(e)(9) (Supp. 2005); *id.* § 12-5-97(g) (2001).

[40] *Id.* § 12-5-31(g) (Supp. 2005); *id.* § 12–5-96(d)(7) (2001).

[41] *Id.* § 12-5-31(h) (Supp. 2005) (surface water permits); *id.* § 12-5-97(a) (2001) (groundwater permits).

The major weakness of Georgia's water management system is the near complete exemption of farm uses from the regulatory oversight of EPD.[42] These farm exemptions, which go far beyond similar exclusions in other states, impair the state's ability to manage its water resources effectively.[43] Unlike municipal or industrial permits, farm use permits are for an unlimited term[44] and may not be revoked or suspended for nonuse once the initial use has commenced, even after extended periods of nonuse.[45] For farm permit applications prior to July 1, 1991, permit quantity is based on pump capacity as of July 1, 1988, rather than a specific quantity determined by reasonable use.[46] Unlike nonfarm users, farm users have not been required to measure water use with meters.[47] In 2003, the Georgia legislature amended the water acts to require meters on new farm uses and began the process of measuring existing farm use,[48] but the large majority of farm withdrawals remain unmonitored.[49] Farm permits constitute the vast majority of total withdrawal permits,[50] and agricultural use is the largest

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[42] *See, e.g.*, Dellapenna, *supra* note 8, at 72 (noting that farm exclusions prevent "rigorous implementation of the regulated riparian scheme").

[43] *Id.*

[44] O.C.G.A. § 12-5-31(a)(3) (Supp. 2005) (surface water permits); *id.* § 12-5-105(b)(1) (groundwater permits).

[45] *Id.* § 12-5-31(k)(4) (surface water permits); *id.* § 12-5-105(b)(2) (groundwater permits). Farm permits may be revoked if no use ever commenced. *Id.* § 12-5-31(k)(4); *id.* § 12-5-105(b)(2).

[46] *Id.* § 12-5-31(a)(3) (surface water permits); *id.* § 12-5-105(a) (groundwater permits). For farm use applications prior to July 1, 1991,

> [a] permit . . . shall be granted . . . at a rate of withdrawal equal to the greater of [1] the operating capacity in place for withdrawal on July 1, 1988, or [2] when measured in gallons per day on a monthly average for a calendar year, the greatest withdrawal capacity during the five-year period immediately preceding July 1, 1988.

Id.

[47] *See* BD. OF NATURAL RES., STATE OF GA., WATER ISSUES WHITE PAPER 21 (May 2001), http://www.dnr.state.ga.us/dnr/environ/gaenviron_files/watrallc_files/wateriss_wp.pdf (noting that "water withdrawal statutes should be amended to require agricultural metering and reporting of the amounts of water used").

[48] Act of June 4, 2003, No. 357, 2003 Ga. Laws 813 (codified at O.C.G.A. § 12-5-31(m) (Supp. 2005) and *id.* § 12-5-105(b) (Supp. 2005)).

[49] *See* Thomas et al., *supra* note 23, at 566 (describing monitoring program to estimate usage).

[50] *See* Don R. Christy, Policy Options for Improving State Management of Agricultural Water Withdrawals in Georgia 25 (2003) (unpublished M.S. thesis, University of Georgia), http://getd.galib.uga.edu/hold5yr/christy_don_r_200305_ms/christy_don_r_200305_ms.pdf

consumptive use of water in the state.[51] As a result, the multiplicity of farm use exceptions in the regulatory system severely limits EPD's ability to provide comprehensive oversight of water use.[52] The disparate treatment of farm and nonfarm use is particularly important when considering any system of water rights transfers or reallocation.

In 2001, in response to increasing demands on limited water resources exacerbated by a five-year drought,[53] the State of Georgia began the process of developing a comprehensive statewide management plan to enable sustainable economic growth within the limits of the natural system.[54] Key issues to be addressed include water supply for an exploding population center in metropolitan Atlanta;[55] excess withdrawal resulting in saltwater intrusion in the Floridan aquifer, interbasin transfers, and basin of origin protection; and integrated planning of wastewater and water supply.[56] The overarching theme of many of these problems is the search for a structure of water allocation that is efficient and sustainable and

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(noting that EPD manages about 750 municipal and industrial permits and about 22,000 farm permits).

[51] *See* Vijendra K. Boken et al., *Water Use Estimation for Some Major Crops in Georgia Using Geospatial Modeling*, *in* 2 PROCEEDINGS OF THE 2003 GEORGIA WATER RESOURCES CONFERENCE, *supra* note 23, at 562, 562 (noting that agricultural sector uses sixty percent of total, more than any other sector); GA. PUB. POLICY FOUND., *supra* note 4, at 7 (noting that irrigation accounts for fifty-four percent of consumptive water use in Georgia).

[52] *See* BD. OF NATURAL RES., *supra* note 47, at 20-21 (discussing farm permit exemptions and recommending changes).

[53] *See* Gerrit Hoogenboom et al., *The Georgia Automated Environmental Monitoring Network: Ten Years of Weather Information for Water Resources Management*, *in* 2 PROCEEDINGS OF THE 2003 GEORGIA WATER RESOURCES CONFERENCE, *supra* note 23, at 896, 896 (presenting data on drought conditions between 1998 and 2002).

[54] *See* Comprehensive State-wide Water Management Planning Act, No. 571, 2004 Ga. Laws 711 (codified at O.C.G.A. §§ 12-5-520 to -525 (Supp. 2005)) (outlining initial plan and obligations of water council); Resolution of April 5, 2001, No. 142, 2001 Ga. Laws 112 (creating Joint Comprehensive Water Plan Study Committee).

[55] *See* JEFFREY ROTHFEDER, EVERY DROP FOR SALE 2 (2001) (noting that largest Atlanta water treatment plant increased its withdrawal from 3.8 billion gallons in 1991 to nearly 20 billion gallons in 2001); Charles Seabrook, *Atlanta Comes Up Dry in Bid for More Water*, ATLANTA J.-CONST., May 26, 2002, at A1 (noting that metro Atlanta exceeded expected water use for 2030 during parts of 1999 and 2000).

[56] *See* Resolution of April 5, 2001, No. 142, 2001 Ga. Laws 112 (listing problems to be addressed by Joint Comprehensive Water Plan Study Committee); GA. JOINT COMPREHENSIVE WATER PLAN STUDY COMM., *supra* note 11, at 5 (listing issues to be addressed in enabling legislation).

that meets the growing needs of municipalities, industry, and agriculture.[57]

The creation of a statewide management plan formally began in 2001 with the creation of the Joint Comprehensive Water Plan Study Committee.[58] Governor Roy Barnes charged the committee with making recommendations regarding the use of the state's water resources.[59] In the 2003 and 2004 legislative sessions, the Georgia General Assembly considered the Joint Study Committee's recommendations and passed enabling legislation directing EPD to create a statewide plan.[60] This plan will be submitted to the legislature for approval by July 1, 2007.[61] The legislation passed in 2004 did not change the legal structure of water rights and allocation, but rather directed EPD to develop a plan, which may or may not require future changes in state water law.[62]

B. TRANSFERS, MODIFICATION, AND REALLOCATION UNDER CURRENT GEORGIA LAW[63]

Georgia law contains no express provisions for the voluntary transfer of water rights or permits between users or potential users, apart from permit transfers accompanying the transfer of land.[64]

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[57] *See* GA. JOINT COMPREHENSIVE WATER PLAN STUDY COMM., *supra* note 11, at 3 (stating purpose of report as effort to "sustain public health, support economic prosperity, and ensure a quality environment"); GA. WATER COAL., A REPORT OF THE GEORGIA WATER COALITION 2 (2002), http://www.gwf.org/gawater/water_coalition_report.pdf (seeking "a sustainable solution to Georgia's water crisis that addresses the needs of agriculture and business and contributes to public health, while maintaining the integrity of Georgia's natural systems").

[58] Resolution of April 5, 2001, No. 142, 2001 Ga. Laws 112.

[59] *Id.*

[60] Comprehensive State-wide Water Management Planning Act, No. 571, 2004 Ga. Laws 711 (codified at O.C.G.A. §§ 12-5-520 to -525 (Supp. 2005)).

[61] O.C.G.A. § 12-5-523(c) (Supp. 2005).

[62] *See id.* §§ 12-5-520 to -525 (enabling legislation with general principles but no change of laws).

[63] For purposes of this Note, a "transfer" refers to the conveyance of a water right or permit from one user to another. "Modification" refers to changes to an existing permit other than a transfer, including changes in permit capacity. "Reallocation" refers to the system-wide process of reorganizing water usages. *But see* REGULATED RIPARIAN MODEL WATER CODE § 2R-2-11 (Am. Soc'y of Civil Eng'rs 1997) (broadly defining "modification" so as to include transfers and reallocation).

[64] *See* O.C.G.A. § 12-5-31(a)(3) (Supp. 2005) (farm permits for surface water "may be transferred or assigned to subsequent owners of the lands which are the subject of such

There are, however, three possible administrative mechanisms under the current statutes that could enable EPD to free up water for reallocation to new users: nonrenewal, revocation for nonuse, and modification of existing permits. The exemption of farm uses from the relevant statutory provisions, however, largely impedes the effective use of these procedures. Additionally, aggressive regulatory action that revokes or reduces existing permits would weaken investment security.[65]

1. Nonrenewal. EPD can reallocate water supply by declining to renew existing permits upon expiration, thereby increasing available water capacity for subsequent reallocation to new permit applicants.[66] Nonrenewal is the primary means of transferring water use under most regulated riparian statutes.[67] Because EPD sets permit duration at ten to fifty years, all nonfarm permits will eventually need to be renewed.[68] EPD has discretion to decline to renew a permit application based on the same criteria for issuing new permits.[69] If EPD determines that a proposed use is necessary or more beneficial than an existing use, EPD has implied authority to reallocate the water to a new user instead of renewing the expired permit.[70] In practice, however, nonrenewal is a limited tool under

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permit"); *id.* § 12-5-105(b)(1) (similar language in groundwater statute); *see also* Stephen E. Draper, Implications for Water Rights Transfers 3-5 (Draper Group, Water Issues White Paper, 2002), http://www.cviog.uga.edu/services/policy/environmental/georgiacommittee/whitepapers/waterrightsxfers.pdf (explaining curious relationship between Georgia Code and common law water rights considering holding in *Pyle*). *But see* Pyle v. Gilbert, 265 S.E.2d 584, 589 (Ga. 1980) (holding that "the right to the reasonable use of water in a non-navigable watercourse on non-riparian land can be acquired by grant from a riparian owner"); Ronald G. Cummings et al., Water Rights Transfers: Options for Institutional Reform 18-19 (Ga. State Univ. Andrew Young Sch. of Policy Studies, Water Policy Working Paper, No. 2001-001, 2001), http://www.cviog.uga.edu/services/policy/environmental/georgiacommittee/whitepapers/rightstransfers.pdf (suggesting expansive interpretation of O.C.G.A. § 12-5-31(a)(3) that would allow transfers apart from land with approval of EPD director, while acknowledging that this interpretation has never been formally advanced).

[65] *See infra* notes 98-101 and accompanying text.

[66] *See* O.C.G.A. § 12-5-31(j) (Supp. 2005) (renewal of surface water permits); *id.* § 12-5-97(b) (2001) (renewal of groundwater permits).

[67] Dellapenna, *supra* note 9, § 9.03(d).

[68] O.C.G.A. § 12-5-31(h) (Supp. 2005) (surface water permits); *id.* § 12-5-97(a) (2001) (groundwater permits).

[69] *Id.* § 12-5-31(j) (Supp. 2005) (renewal of surface water permits); *id.* § 12-5-97(b) (2001) (renewal of groundwater permits); *see supra* note 39 (listing factors for permit applications).

[70] *Id.* § 12-5-31(f) (Supp. 2005). In situations where competing surface water uses qualify equally under the application factors in subsection (e), "the director shall give preference to

current law because farm permits have no term and therefore will never require renewal.[71] Even for nonfarm permits, nonrenewal would be an extremely slow method of reallocation, because nonfarm permits can have terms of up to fifty years.

2. Revocation for Nonuse. EPD has authority to revoke permits for nonuse by the permittee.[72] In theory, revocation of such permits would free up permit capacity for reallocation to new users. In practice, however, there are two limitations to effective reallocation through revocation for nonuse: first, farm permits are irrevocable;[73] and second, revocation of an unused water permit does not return any additional water to the hydrologic system that can then be reallocated to new users.

It has been widely argued that farm permits should be revocable for nonuse.[74] There are thousands of outstanding farm permits that are not in use,[75] and synchronizing permitted capacity with actual usage would improve the regulatory system.[76] If unused farm permits could be revoked by EPD, then additional capacity might be

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an existing user." This implies that where an initial applicant's proposed use is deemed more necessary or beneficial, the director has discretion to deny renewal to the existing user. *Id.*; *see also id.* § 12-5-97(b) (2001) (renewal of groundwater permits). The groundwater statute contains similar language, with two key differences: first, the statute does not specify that preference shall be given to existing uses; and second, renewal must be consistent with a regional water development and conservation plan for the aquifer. *Id.* § 12-5-96.

[71] *Id.* § 12-5-31(a)(3) (Supp. 2005) (surface water farm permits); *id.* § 12-5-105(b)(1) (2001) (groundwater farm permits).

[72] *Id.* § 12-5-31(k)(4) (stating that surface water permits may be permanently revoked by EPD director after period of two consecutive years of nonuse, unless nonuse was due to "extreme hardship"); *id.* § 12-5-96(c)(3) (giving EPD authority to revoke any groundwater permit).

[73] *Id.* § 12-5-31(k)(4) (Supp. 2005). Revocation for nonuse does not apply to surface water farm permits after the initial use has commenced, even where use has not occurred for a substantial period of time. *Id.* Farm permits can be revoked if the initial use never occurred. *Id.* The groundwater statute contains identical provisions. *Id.* § 12-5-105(b)(2).

[74] *See* BD. OF NATURAL RES., *supra* note 47, at 20 ("The water withdrawal statutes need to be amended to allow EPD to revoke unused agricultural permits. . . ."); Cummings et al., *supra* note 64, at 18 ("[F]orfeiture for nonuse is a desirable feature of an efficient water rights system."); Dellapenna, *supra* note 8, at 72 (stating "important failing of the two statutes is their near complete exemption of farm uses").

[75] *See* BD. OF NATURAL RES., *supra* note 47, at 20 ("These permits account for tens of thousands of acres in the Flint River basin alone . . . ."); GA. PUB. POLICY FOUND., *supra* note 4, at 3 (estimating that only 15,000 to 18,000 of more than 21,000 agricultural permitted pumps are in active use).

[76] *See* BD. OF NATURAL RES., *supra* note 47, at 20-21 (advocating synchronization).

made available to new applicants.[77] Any reallocation, however, must be dependent upon stream flow and hydrologic capacity. Revoking an unused permit and reissuing it to a new user who begins withdrawing water is a transfer that will result in a net increase in water withdrawal.[78] In situations where the water resource is already overextended, permits revoked for nonuse should not be reallocated to new users.

In some cases, however, revocation for nonuse could enable new applicants to obtain permits. To the extent that EPD estimates total withdrawals based on acreage under irrigation, revoking unused permits would take acres out of irrigation estimates.[79] This would enable EPD to determine with increased certainty the maximum permitted capacity and to issue new permits if capacity is available.[80]

3. Modification of Existing Permits. EPD has the authority to reduce the capacity of existing permits for the purpose of reallocating that water to new users. Georgia law goes further than most states in this regard.[81] The surface water statute states, "The director may suspend or modify a permit . . . if he should determine . . . that the quantity of water allowed under the permit is greater than that needed . . . for the particular use . . . or would prevent other applicants from reasonable use of surface waters . . . ."[82] When two "applicants or users qualify equally," the director has authority to modify existing permits on a "prorated or other reasonable basis."[83] It is significant that the statute refers to "applicants" in addition to users because this empowers EPD to

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[77] *See* Cummings et al., *supra* note 64, at 11 ("[W]ater that could be put to socially beneficial uses is left idle by the nondiligent water rights holder.").

[78] *Cf. id.* at 27-28 (expressing concern that transferring unused permits to new users could increase use if permits are not appropriately quantified).

[79] *See* BD. OF NATURAL RES., *supra* note 47, at 20-21 (stating that in estimating water usage, EPD must treat these acres as though they are actually being used when making allocation decisions).

[80] *Id.*

[81] *See* Dellapenna, *supra* note 9, § 9.03(d) (noting that Georgia law grants more modification power to agency than laws in other regulated riparian states).

[82] O.C.G.A. § 12-5-31(k)(6) (Supp. 2005) (surface water permits). The Groundwater Act contains a general provision granting power to EPD "[t]o modify or revoke any permit upon . . . notice." *Id.* § 12-5-96(c)(3) (2001).

[83] *Id.* § 12-5-31(f) (Supp. 2005). There is no similar provision in the Groundwater Act.

modify permits both to protect current users and to allow new users to obtain permits.[84] These provisions give broad authority to EPD to reduce withdrawal of existing permits for the purpose of reallocating water to new uses.[85]

For purposes of modification, farm permits are not fully exempt from EPD regulatory authority. While farm permits cannot be modified to free up capacity for municipal or industrial uses, farm permits can be modified to allow other *farm* uses.[86] This should allow EPD to modify a farm permit where the use would "prevent other applicants from reasonable use . . . for farm use."[87] Through these modification provisions, EPD has authority to reallocate water between farm uses and from nonfarm uses to farm uses. The only legal limitation is an inability to modify a farm permit to reallocate the water to a municipal or industrial user.[88]

4. Emergency Authority. EPD is also granted emergency modification powers in the event of extreme shortages that endanger "the health or safety of the citizens . . . or [that] threaten serious harm to the water resources."[89] Farm permits are not exempt from these provisions.[90] During an emergency period, EPD must "give first priority to providing water for human consumption

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[84] Both subsection (f) and subsection (k) expressly refer to "applicants." *Id.* § 12-5-31(f) (Supp. 2005); *id.* § 12-5-31(k)(6) to (7). Preference is to be given to an existing use over an initial application. *Id.* § 12-5-31(f); *see also id.* § 12-5-96(c), (d) (2001) (allowing applicants to be considered in modifications of groundwater permits). The groundwater statute grants modification authority pursuant to the same conditions for issuing permits. *Id.* § 12-5-96(d).

[85] As part of its Interim Strategy for Managing Salt Water Intrusion in the Upper Floridan Aquifer of Southeast Georgia, EPD pursued a strategy of modification in consultation with permittees and other stakeholders. Interim Strategy for Managing Salt Water Intrusion in the Upper Floridan Aquifer of Southeast Georgia (Apr. 23, 1997), *reprinted in* JAMES E. KUNDELL & DIANA TETENS, WHOSE WATER IS IT?: MAJOR WATER ALLOCATION ISSUES FACING GEORGIA 44, 52 (1998), *available at* http://www.cviog.uga.edu/services/policy/environmental/georgiacommittee/publications/whose.pdf.

[86] O.C.G.A. § 12-5-31(k)(7) (Supp. 2005); *id.* § 12-5-105(b)(3).

[87] *Id.* § 12-5-31(k)(7); *id.* § 12-5-105(b)(3).

[88] *Id.* § 12-5-31(k)(6) (exempting surface water farm permits from suspension or modification); *id.* § 12-5-105(b)(3) (stating that farm permits may only be modified to allow other farm uses).

[89] *Id.* § 12-5-31(*l*)(1). The emergency power provisions of the Groundwater Act are similar but are more restrictive, authorizing such powers in "an emergency situation requiring immediate action to protect the public health or welfare . . . ." *Id.* § 12-5-102(a) (2001).

[90] *See id.* § 12-5-31(*l*) (Supp. 2005); *id.* § 12-5-102 (2001) (applying to both farm and nonfarm permits, though farm users are granted enhanced rights to appeal modifications).

and second priority to farm use."[91] Although these emergency powers give EPD authority to modify existing permits for the purpose of reallocation, this authority is quite limited.[92] Therefore, the emergency powers should not be considered a mechanism for reallocation except in the most severe circumstances. Reliance on actions taken in times of extreme shortage will not be an efficient method for reallocation in the long term.[93]

5. Practical Problems. Even though these mechanisms for reallocation exist under current law, a number of practical problems limit their effectiveness as tools for efficient reallocation. First, as discussed, farm permits are exempt from the renewal process and are mostly exempt from revocation for nonuse and modification.[94] Second, EPD operates with minimal funding, which is a major limitation on the ability of the agency to provide adequate regulatory oversight.[95] If EPD were to take a more active role in reallocation through its existing regulatory powers, it would need additional resources to perform effectively.[96] Third, the lack of agricultural metering makes it difficult for EPD to monitor usage accurately in southwest Georgia.[97] Effective reallocation would require more precise knowledge of usage if EPD is to revoke permits for nonuse or reduce permits for waste.

Relying on these methods would also lead to larger institutional problems if system-wide reallocation were necessary. Although revocation of a permit after an extended period of nonuse is good regulatory policy, forced transfers brought about by arbitrary or excessive permit modification would threaten economic growth by creating investment insecurity in water rights.[98] If EPD were to begin a practice of regularly declining renewal of existing permits,

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[91] *Id.* § 12-5-31(*l*)(3) (Supp. 2005) (surface water); *id.* § 12-5-102(c) (2001) (groundwater).

[92] *See id.* § 12-5-102(a) (2001) (applying only to shortages that threaten "public health or welfare").

[93] *See* Dellapenna, *supra* note 9, § 9.03(d) (noting that reliance on emergency authority will be inefficient and temporary).

[94] *See supra* notes 72-88 and accompanying text.

[95] BD. OF NATURAL RES., *supra* note 47, at 9-10 (describing need to fund water programs as "[t]he most important issue").

[96] *Id.*

[97] *Id.* at 21 ("The water withdrawal statutes should be amended to require agricultural metering and reporting of the amounts of water used.").

[98] *See* Dellapenna, *supra* note 9, § 9.03(a)(4) (discussing length of permit periods).

fear of nonrenewal could deter capital investment in existing water-use systems.[99] Arbitrary permit modifications, undertaken by an incompetent or corrupt agency, would inhibit long-term planning by water users.[100] Indeed, one of the original purposes of the permit system was to increase investment security in existing water rights.[101] An administrative policy that includes involuntary nonrenewal or modification—in effect ending active water uses—should only be adopted in emergency situations. In any administrative action, the state must be careful not to act in ways that unfairly burden productive holders of water rights.

Revoking permits for nonuse, however, would greatly improve the state's system of water management by bringing permitted capacity closer in line with actual usage. EPD would need to implement comprehensive public notice procedures so as not to impose excessive hardship upon current permit holders.[102] Criteria for revocation for nonuse should be objective and publicly available. In the case of farm permits, the standard for revocation should account for periodic crop rotation, and therefore may need to allow more than the two year window of nonuse allowed to nonfarm permits.[103] Overall, however, the multiplicity of exemptions for farm use hinders the state's ability to manage its water resources effectively. Adopting a policy of revoking permits for extended nonuse would be an important step towards bringing farm use permits in line with other water permits.[104]

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[99] *Id.*

[100] *Id.*

[101] *Id.* § 9.03(d).

[102] *See* Gregory W. Blount et al., The Role of Water Rights and Georgia Law in Comprehensive Water Planning for Georgia 6-7 (Ga. Chamber of Commerce, Water Issues White Paper, 2002), http://www.cviog.uga.edu/services/policy/environmental/georgiacommittee/whitepapers/rightsandlaws.pdf (advocating expanded public notice on permit actions).

[103] *Cf.* Ronald G. Cummings et al., Changing Rules for Agricultural Water Use: Policy Options Related to Metering and Forfeiture for Nonuse 10-15 (Ga. State Univ., Andrew Young Sch. of Policy Studies, Water Policy Working Paper No. 2001-03, 2001), http://www.cviog.uga.edu/services/policy/environmental/georgiacommittee/whitepapers/agriculturalpolicy.pdf (advocating extending forfeiture provisions to include agricultural water use and discussing criteria and potential issues).

[104] *Id.*

III. REALLOCATION THROUGH PRIVATE INCENTIVES

A. WATER MARKETS, VOLUNTARY TRANSFERS, AND THIRD-PARTY EFFECTS

In a water market, users are allowed to transfer water rights voluntarily among themselves.[105] Prospective users may purchase water rights from existing users who have reduced or terminated their usage.[106] A well-functioning market is the most efficient institution for allocating a scarce resource.[107] Unlike regulation, markets are flexible, voluntary, and free from politics.[108] They automatically determine the value of the water, allow parties to calculate their own risk and opportunity, and are the traditional method used for allocating scarce resources.[109] Most western states allocate water under a private property model and allow, if not encourage, water markets.[110] The state often places limits on transferability and plays a role in regulating private transfers.[111]

The primary problem with markets for water resources is that high transaction costs and externalities may result in either inefficient or socially undesirable transfers.[112] Markets have not been used as a tool for reallocation in eastern states, and as a result, it is unclear whether a water market could ever be an effective method for reallocation under a permit system.[113] A totally

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[105] For purposes of this Note, "water market" and "permit trading" are used interchangeably to refer to a system that allows for voluntary transferability between water users. *See* Joseph W. Dellapenna, *The Importance of Getting Names Right: The Myth of Markets for Water*, 25 WM. & MARY ENVTL. L. & POL'Y REV. 317, 319-21 (2000) (explaining that term "market" is also frequently used to describe processes which are actually more administrative).

[106] *See generally* Anderson et al., *supra* note 17, § 14.01(b)(2) (describing water markets).

[107] *See* GA. PUB. POLICY FOUND., *supra* note 4, at 14-17 (presenting hypothetical model of permit trading).

[108] Anderson et al., *supra* note 17, § 14.01(b)(2), at 14-11.

[109] *Id.*

[110] *See id.* § 14.04(a) (discussing approaches of various western states to water markets).

[111] *See id.* § 14.01(b)(2)(A), at 14-13 (discussing state-enacted market restraints).

[112] *See* Dellapenna, *supra* note 105, at 355 ("[P]rotections prevent market-generated externalities from destroying the property rights of third parties.").

[113] *See* Dellapenna, *supra* note 9, § 9.03(d) (finding that only three regulated riparian statutes—Maryland, Iowa, and Minnesota—acknowledge the possibility of user-initiated transfers). Dellapenna questions whether a market could ever be successful in permit states. *Id.*

unrestricted market could have a variety of negative consequences for the State of Georgia unless proper limitations were imposed to protect third parties and the public interest.[114] These necessary limitations, however, detract from the efficiency benefits that a market purports to bring to the system.[115]

Administrative regulation of a water market is essential to protect third parties and the public interest from the externalities of individual transfers.[116] Any change in the location, time, duration, or character of a use has the potential to affect other water users.[117] A transfer from a less consumptive use to a more consumptive use will cause a net loss of water from the hydrologic system.[118] A sale of a water right that involves an interbasin transfer removes water from the transferor basin and adds water to the transferee basin. This transfer may adversely affect the basin of origin.[119] These external effects will not be taken into consideration by the transacting parties, and if the externality is greater than the gains to the transacting parties, then the market sale will result in a net societal loss.[120] Judge Richard Posner has illustrated the potential impact that changes in location or use can have on net value:

> If A wants to sell his right to X, and X plans to use the water in the same place and manner as A, the transfer will have no impact on the water rights of the other users of the stream. . . . If effects on return flow were ignored [when the place and manner change,

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[114] *See infra* notes 142-82 and accompanying text.

[115] *See* Dellapenna, *supra* note 105, at 354-56 (discussing importance of protection of third-party rights to limit externalities).

[116] *See* BONNIE COLBY SALIBA & DAVID B. BUSH, WATER MARKETS IN THEORY AND PRACTICE 236 (1987) (noting that with "under-regulation" of markets, significant external impacts may be ignored).

[117] *See id.* (discussing external impacts of transfers).

[118] *See* Draper, *supra* note 24, at 4-5 (considering consumptive use in light of transfers and concluding that serious downstream disruptions are possible).

[119] *See* Stephen E. Draper, *Sharing Water Through Interbasin Transfer and Basin of Origin Protection in Georgia: Issues for Evaluation in Comprehensive State Water Planning for Georgia's Surface Water Rivers and Groundwater Aquifers*, 21 GA. ST. U. L. REV. 339, 341-42 (2004) (advocating comprehensive interbasin transfer policy for Georgia).

[120] *See* SALIBA & BUSH, *supra* note 116, at 236 (noting that "transfers may occur that are not economically beneficial").

> however], many water transfers would reduce overall value. Suppose A's water right is worth $100 to him and $125 to X . . . but whereas A returns one-half of the water he diverted to the stream, where it is used by B, X will return only one-fourth of the water it obtains from A, and at a point far below B, where it will be appropriated by D. And suppose B would not sell his right to A's return flow for less than $50, while D would sell his right in the municipality's return flow for $10. To let A sell his water right to X because it is worth more to X than to A would be inefficient, for the total value of the water would be less in its new uses (X's and D's) — $135 — than in its present uses (A and B's) — $150.[121]

To ensure that private transactions do not decrease overall value, a water market needs active administrative oversight; each transfer should require agency evaluation and a period of time for third parties to object.[122] Such restraints would decrease the efficiency of the transactions, creating an apparent tradeoff between efficiency of the market and the protection of the third-party interests.[123] But this is only true for "efficiency" as it relates to the transacting parties. Certainly, increasing the transaction costs will decrease efficiency for the transferring parties, and transactions will only occur if the difference in value between the buyer and seller is greater than these transaction costs.[124] Imposing limitations, however, is necessary to ensure that the transfer does not result in a net societal loss.

Allowing transactions to go forward without fully considering the adverse effects creates the possibility that transfers will not lead to

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[121] RICHARD A. POSNER, ECONOMIC ANALYSIS OF LAW § 3.12, at 76 (6th ed. 2003); *see also* Dellapenna, *supra* note 105, at 255-56 (citing Posner).

[122] In states following an appropriative rights, or private property, model of water rights, "state laws stipulate that third-party water users with a perfected water right may not be injured as a result of a water transfer." SALIBA & BUSH, *supra* note 116, at 246.

[123] *See id.* at 236 (advocating need for balance between transactions costs associated with third-party protection and benefits of efficient market transactions).

[124] J.T. Winpenny, *The Value of Water Valuation*, *in* WATER POLICY: ALLOCATION AND MANAGEMENT IN PRACTICE 197, 202 (Peter Howsam & Richard Carter eds., 1996).

an optimal societal result.[125] A gain for the transacting parties that results in negative impacts for downstream users may be "efficient" for the transacting parties, but it is not beneficial to society. Reducing transaction costs in order to achieve more transfers through an "efficient" market would make a water market more active, but not necessarily more effective in reallocating water to higher-valued uses at the lowest societal cost.[126] Such a system would simply increase the benefits to the transacting parties at the expense of everyone else.

For eastern states, the *Regulated Riparian Model Water Code* (the *Model Code*) cautiously encourages transferability of permits through market mechanisms.[127] Under the *Model Code*, any permit transfer would be subject to approval by the administering agency based on the same criteria used for the initial issuance of the original permit.[128] The agency must consider potential injury to other users,[129] and, where adversely affected third parties have not given consent, the agency must condition a transfer on the payment of adequate compensation to adversely affected water rights holders.[130] The transferee, i.e., buyer, would be required to pay not only the transferor, but also any other adversely affected users, thereby mitigating the externalities of the transfer. In addition, the *Model Code* pays particular attention to protecting the public interest through a blanket requirement of safe yield,[131] special provisions governing interbasin transfers,[132] and consideration of sustainability and general environmental effects.[133] These precautions are necessary to ensure that transfers to higher-valued

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[125] *See* SALIBA & BUSH, *supra* note 116, at 236 (discussing ramifications of under-regulation); Dellapenna, *supra* note 105, at 354-56 (discussing adverse effects).

[126] *See* POSNER, *supra* note 121, at 76 (explaining possibility of third-party effects); Dellapenna, *supra* note 105, at 354-56 (same).

[127] REGULATED RIPARIAN MODEL WATER CODE § 1R-1-07 (Am. Soc'y of Civil Eng'rs 1997) (encouraging sale or modification "subject to the protection of third parties and the public interest").

[128] *See id.* § 7R-2-01 (requiring agency approval); *id.* § 7R-2-02(1) (approving transfers according to standards for issuing initial permit).

[129] *Id.* § 6R-3-02(d).

[130] *Id.* § 7R-2-02(2).

[131] *Id.* § 6R-3-01(1)(b).

[132] *Id.* § 6R-3-06.

[133] *Id.* § 6R-3-02(e)(1), (2).

uses do not have adverse consequences that exceed the gains from trade.

B. WATER MARKET PROPOSALS IN GEORGIA

In 2003, the Georgia General Assembly considered a bill that would have created a system of transferable water permits.[134] Current law only allows for the transfer of agricultural withdrawal permits when tied to the sale of land to a subsequent agricultural user.[135] Under such a transfer, the use and location would remain constant, thereby preserving EPD's initial determination of reasonableness in granting the permit.[136] The 2003 proposal would have allowed permit holders to sell their permits to new users apart from transfers of land.[137] The legislation would have enabled transfers between different types of uses—for example, from agricultural to municipal—and to different withdrawal locations.[138] The bill was voted down in one of the final votes of the session.[139]

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[134] *See* H.B. 237, 149th Gen. Assem., Reg. Sess. (Ga. 2003), *reprinted in* 1 GA. HOUSE J. REGULAR SESSION 2003, at 795, 803 [hereinafter GA. HOUSE J. 2003] (as introduced in Georgia House of Representatives); H.B. 237, 149th Gen. Assem., Reg. Sess. (Ga. 2003), *reprinted in* 2 GA. SENATE J. REGULAR SESSION 2003, at 2113, 2121-23 [hereinafter GA. SENATE J. 2003] (as passed by Senate Natural Resources and the Environment Committee); H.B. 237, 2 GA. HOUSE J. 2003, at 3942, 3951 (as reported by Committee of Conference and rejected by House of Representatives).

[135] O.C.G.A. § 12-5-31(a)(3) (Supp. 2005).

[136] Fortuna, *supra* note 1, at 1056 n.303.

[137] The original version of House Bill 237 provided that "[w]hen there is a constraint on the issuance of new permits for use in any area of the state," the director may issue a permit to a new applicant if "any existing user or users . . . provide their written consent to revocation of their permits, in whole or in part, in sufficient amounts." H.B. 237, 1 GA. HOUSE J. 2003, *supra* note 134, at 803 (permit trading provisions as introduced). Through this provision, an indirect market for water permits could develop, with buyers paying sellers to surrender existing permits in exchange for a new permit to be issued by EPD. The new permit applicant, i.e., the buyer, would be required to show that the transfer would not reduce the water available to downstream users, and the director would have discretion to "impose permit requirements or other conditions on use as may be needed to prevent unreasonably adverse effects on third parties and the public interest." *Id.* The bill's sponsors envisioned that this provision would create an efficient mechanism for permit reallocation in areas under the permit moratorium. *See* Bob Hanner, Op-Ed., *Critics of House Bill Lob Many False Claims*, ATLANTA J.-CONST., Apr. 9, 2003, at A23 (citing stagnated economic growth as reasons for permit transfers).

[138] *Cf.* H.B. 237, 1 GA. HOUSE J. 2003, *supra* note 134, at 803 (including no specific geographical limitations).

[139] *See* H.B. 237, 2 GA. HOUSE J. 2003, *supra* note 134, at 3972-74 (rejecting conference

Questions remain, however, as to whether some form of a market would be an appropriate system for reallocating water permits in Georgia. The introduction of markets raises a variety of legal and economic problems, only some of which were considered in the 2003 legislation. In addition to the issue of third-party protection discussed above,[140] these issues include uncertain property rights, unquantified water rights, constitutional issues, interbasin transfers, and other social issues.[141]

1. Uncertain Property Rights. The most fundamental problem with introducing water trading in Georgia is the lack of clearly defined property rights in water permits. Clearly defined property rights are a prerequisite to any system of water rights trading through a market.[142] Without such clearly defined rights, transactions will not occur because buyers are unwilling to pay for insecure property interests.[143] Buyers will simply be unwilling to enter into transactions if they are not sure that their new property rights will be enforceable and that they will actually be able to make

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committee version 60 to 105, and 61 to 98 on reconsideration).

[140] *See supra* notes 116-33 and accompanying text. The limited protections in the original version of the proposed statute would be unlikely to fully protect third parties and the public interest. Unlike similar provisions in the *Model Code*, H.B. 237 would not have explicitly required EPD to evaluate the full range of application factors when reissuing a transferred permit, nor would EPD have been required to establish a requirement of safe yield to ensure sustainable use of the resource. *Compare* H.B. 237, 1 GA. HOUSE J. 2003, *supra* note 134, at 803 ("[T]he director may impose permit requirements . . . as may be needed to prevent unreasonably adverse effects . . . ."), *with* REGULATED RIPARIAN MODEL WATER CODE § 7R-2-02(1) (Am. Soc'y of Civil Eng'rs 1997) (approving transfers according to standards for issuing initial permit). The conference committee version removed even the limited protections in the initial bill, stating "any amount of water withdrawal authorization so surrendered *shall* be made available for issuance of new withdrawal permits . . . to any other applicant designated by the permittee." H.B. 237, 2 GA. HOUSE J. 2003, *supra* note 134, at 3951 (emphasis added) (applying only to surface water). On its face, this clause would grant no authority to EPD to restrict transfers based on third-party effects, the public interest, or the status of the water source. Such an unrestricted market is a far cry from the limited transferability and extensive protections of the *Model Code* and would allow transactions between private parties even where such transactions would result in a net societal loss.

[141] For a discussion of many of the problems with water markets in Georgia, including constitutional implications, transaction costs and valuation, equity concerns, failure of markets to value "public" benefits, potential windfall to current permit holders, quantification problems with farm permits, and effects of large-scale transfers from rural to urban areas, see Fortuna, *supra* note 1, at 1051-65.

[142] *See* LARRY SIMPSON & KLAS RINGSKOG, WATER MARKETS IN THE AMERICAS 4 (1997) (stating that rights must be secure and viable).

[143] *Id.* at 6.

use of the water right they have purchased on the market.[144] In this context, the absence of clearly defined property rights introduces uncertainty into the water right being traded and hampers the efficiency of the market.[145]

In Georgia, the lack of clearly defined property rights, combined with the introduction of transferability, creates a more serious problem. The uncertainty in Georgia law as to the nature of the right transferred opens a window for users to expand their interests and circumvent the state's permit system. Disputes have already arisen. Some permit holders have claimed full private property rights over groundwater, rather than the reasonable use rights intended by the water statutes.[146] The result of introducing a water market in the face of this uncertainty would not merely be diminished market efficiency, but a risk that purchasing parties will abuse the market and take advantage of nebulous property rights to claim that water is private property. This abuse, if realized, could have an enormous impact on the state's ability to manage its water resources.

The State of Georgia is already in litigation with parties who seek to expand the scope of their permitted rights. In June 2005, Chief Judge Lamar W. Davis Jr. of the U.S. Bankruptcy Court for the Southern District of Georgia issued an order stating that the Durango Georgia Paper Company could auction off its forty-four million GPD groundwater permit to repay creditors.[147] The bankruptcy trustee argued that once groundwater has been pumped out of the ground, it becomes fully private property.[148] The State of Georgia has objected to the auction, and EPD has stated that it will

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[144] *Id.*

[145] *See* Warren Musgrave, *Decentralized Mechanisms and Institutions for Managing Water Resources: Reflections on Experiences from Australia*, *in* DECENTRALIZATION AND COORDINATION OF WATER RESOURCE MANAGEMENT 429, 435 (Douglas D. Parker & Yacov Tsur eds., 1997) (noting that efficiency and effectiveness of markets will be diminished by property rights that are not specified and enforceable).

[146] *See infra* notes 147-50 and accompanying text.

[147] Order at 7-8, *In re* Durango Georgia Paper Co., No. 02-21669 (Bankr. S.D. Ga. June 17, 2005); *see also* Stacy Shelton, *Auction Date Set for Water Rights*, ATLANTA J.-CONST., July 9, 2005, at E6 (providing background of bankruptcy litigation).

[148] *See* Ward Stone Jr., Letter to the Editor, *Bankruptcy Judge's Order on Water Permit Was Right*, SAVANNAH MORNING NEWS, July 2, 2005, at 6A (stating that permits are tradeable interests).

not approve a transfer of the permit to a different location for a different purpose.[149]

The Durango litigation may result in a clarification of property rights in Georgia groundwater. Regardless, the current uncertainty must be resolved prior to consideration of transferability.[150] If groundwater were to become fully transferable as private property, then the state could lose the power to regulate the use of its water resources.[151]

2. Unquantified Water Rights and "Sleeper" Permits. The issue of uncertain property rights relates to the problems presented by unquantified water rights. Because the withdrawal limits on Georgia agricultural permits are not clearly defined, introducing transferability has the potential of dramatically increasing the total amount of water withdrawn.[152] Farm permits issued prior to 1988 are based on pump capacity rather than actual usage, and so the capacity of any given permit may exceed the quantity of water that is really being used.[153] Permit holders who are not currently withdrawing water or who have excess capacity available under

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[149] Memorandum from Carol Couch, EPD Director (May 25, 2005) (on file with author) ("Georgia law authorizes a permit transfer in appropriate cases 'with the approval of' the Environmental Protection Division. EPD would not consider transfer of the permit to other entities for different purposes at different locations as an appropriate case."); *see also* Brian Basinger & Gordon Jackson, *EPD Chief Challenges Water Permit Bidding*, SAVANNAH MORNING NEWS, May 26, 2005, at 5B (including statements by EPD Director Carol Couch).

[150] *See* Fortuna, *supra* note 1, at 1048-50 (discussing various views on surface water rights and discrediting theory of absolute ownership); *id.* at 1043-47 (advocating clarification of groundwater rights away from doctrine of absolute ownership).

[151] The 2003 market proposal in the original version of H.B. 237 sought to avoid property rights issues by allowing only indirect transfers. All permit transfers would have gone through EPD: first, the current permit holder would surrender a permit to the state, and second, the state would issue a new permit to the new applicant. H.B. 237, 1 GA. HOUSE J. 2003, *supra* note 134, at 803. Presumably, this would have maintained the usufructuary character of the permit, and the state would have retained ultimate control of all permits through the water statutes. More certainty on this issue is needed before considering voluntary permit transfers, and Georgia should move to clarify the scope of water rights first. The final version of the bill removed EPD discretion by stating that the director "shall" issue a permit to the transferee. H.B. 237, 2 GA. HOUSE J. 2003, *supra* note 134, at 3951. If read literally, this language may have allowed unconditional transfers without giving EPD the power to block transfers in the interest of third parties or the public interest.

[152] *See* Fortuna, *supra* note 1, at 1061 (explaining potential for water market to drastically increase total usage).

[153] *See supra* note 46 (giving statutory standards for permitted withdrawals based on pump capacity rather than a fixed quantity).

their permits will be the first to place these water rights up for sale.[154] The holders of these "sleeper" permits will have an incentive to sell their excess permit capacity to cash in the value of these assets.[155] In addition to providing a windfall profit to sleeper permit holders, who received the permit from the state at no cost, such a transaction will substitute use for nonuse. While the transacting parties stand to profit, the increase in total water usage may affect the reliability of supply for other users.[156] The cost to society of added use, possibly exceeding a safe yield in total water withdrawal, will not be reflected in private transfers.

There are two possible solutions to the problem of sleeper permits. First, the administering agency could address capacity problems by requiring quantification of permits prior to transfer.[157] This requirement would prevent transfers that substitute use for nonuse and increase total water withdrawal. But quantification must be done in a way that does not allow current users to temporarily increase usage prior to quantification for the purpose of staking a claim to additional capacity that could later be sold.[158] Second, the state could require a conservation offset as a condition to transfers. With such an offset, there would be a volumetric reduction factor of the nominal quantity of water transferred, calculated as a percentage of the total.[159] For example, if a 50%

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[154] The permit held by the Durango Georgia Paper Company is a striking example of a sleeper permit. The plant has not been withdrawing water since it went out of business, and the forty-four million GPD permit is potentially up for auction. *See supra* notes 147-49 and accompanying text.

[155] *See* Musgrave, *supra* note 145, at 436-37 (discussing problem of sleeper entitlements in Australian experience).

[156] *Id.* at 437.

[157] A substitute to H.B. 237 presented by the Senate Natural Resources Committee would have required quantification prior to transfers. It would have authorized EPD to develop a system for quantifying permits that were originally issued based on pump capacity. H.B. 237, 2 GA. SENATE J. 2003, *supra* note 134, at 2122.

[158] It is also important not to penalize those who are using less water as a result of conservation efforts. *See* Andrew G. Keeler & Todd C. Rasmussen, *Essential Decisions for an Instream Flow Policy*, *in* 1 PROCEEDINGS OF THE 2005 GEORGIA WATER RESOURCES CONFERENCE, *supra* note 19, at 266, 268 (discussing modification to maximum limits on agricultural permits).

[159] The Senate substitute to H.B. 237 would have required a 25% offset to preserve in-stream flows. H.B. 237, 2 GA. SENATE J. 2003, *supra* note 134, at 2121. Under this offset provision, the transferred permit would be reissued for less than the amount forfeited. *Id.* Arbitrarily, however, the offset would not have applied to transfers within agriculture or to

offset were required, a purchaser who needs 1,000,000 GPD would need to acquire 1,500,000 GPD from the transferor. The 50% offset, in this case 500,000 GPD, would remain in the natural system to preserve in-stream flows and maintain the reliability of the water supply. Offsets are a crude solution, however, because it is difficult to calculate the amount of reduction necessary to correct for activation of sleeper permits.[160]

3. Constitutional and Treaty Issues. Introduction of a water market in Georgia would raise profound constitutional and international treaty issues. Permit trading would implicate the dormant commerce clause of the United States Constitution, the North American Free Trade Agreement (NAFTA), and the General Agreement on Tariffs and Trade (GATT).[161]

First, the dormant commerce clause, NAFTA, and GATT could limit the power of the state to prevent the export of its water resources to other states or countries,[162] because they impose limits on state interference with interstate and international commerce. Under dormant commerce clause jurisprudence, state statutes which are discriminatory towards other states in either purpose or effect will be struck down unless they further a legitimate local purpose and there are no less discriminatory alternatives.[163] A discriminatory restriction for the purpose of "economic

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transfers under 10,000,000 GPD. *Id.* This offset, therefore, would not have addressed the principal source of sleeper permits, agricultural permits, which have no clearly defined capacity and cannot be revoked for nonuse.

[160] *See* Musgrave, *supra* note 145, at 437 (noting that offsets are "crude"). It is unclear whether the 25% offset in the Senate version of H.B. 237 would have been sufficient. Notably, even some market proponents in Georgia have suggested that a 100% offset or more may be necessary, depending on the specific transaction. Cummings et al., *supra* note 64, at 30-31 (presenting numbers for exposition only). Parts of South Australia require a 10% reduction of the original allocation for transfers within agriculture, and a 70% reduction for transfers from agriculture to another sector. *See* Musgrave, *supra* note 145, at 438 (charting restrictions in Australia by state).

[161] For a more detailed discussion of the dormant commerce clause implications, see Fortuna, *supra* note 1, at 1051-57. *See generally* Douglas L. Grant, *State Regulation of Interstate Water Export*, *in* 4 WATERS AND WATER RIGHTS, *supra* note 9, § 48.03 (discussing dormant commerce clause).

[162] In addition to concrete demand from neighboring states, international transport of water by barge is increasingly possible. *See* ROTHFEDER, *supra* note 55, at 119-26 (describing water shipping options).

[163] Hughes v. Oklahoma, 441 U.S. 322, 336 (1979).

protectionism" is "virtually per se invalid."[164] In the 1982 case *Sporhase v. Nebraska*,[165] the Court held that groundwater is an article of commerce, and that state restrictions on its export are subject to the limitation of the dormant commerce clause.[166] NAFTA and GATT contain similar nondiscrimination prescriptions, which apply dormant commerce clause principles to international trade of a commoditized natural resource.[167] If water were to become an article of commerce in Georgia through the introduction of a water market, then the dormant commerce clause and these international trade agreements could limit state law restrictions on water export from Georgia.[168] If state export restrictions were invalidated, Georgia would be left with little or no control over the export of its water resources.[169]

Georgia could address the constitutional issues raised by permit transfers in two ways. First, the state could limit transfers on the basis of watershed boundaries rather than by arbitrary political boundaries.[170] Such a restriction would serve the legitimate state

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[164] *See* Fortuna, *supra* note 1, at 1055 n.298 (citing various decisions).

[165] 458 U.S. 941 (1982).

[166] *Id.* at 954.

[167] *See* Daniel A. Farber & Robert E. Hudec, *Free Trade and the Regulatory State: A GATT's-Eye View of the Dormant Commerce Clause*, 47 VAND. L. REV. 1401, 1403 (1994) (noting that while GATT case law is not as developed as dormant commerce clause law, GATT agreements contain "a number of [dormant commerce clause]-like prescriptions"); David A. Wirth, *The President, the Environment, and Foreign Policy: The Globalization of Environmental Politics*, 24 J. LAND RESOURCES & ENVTL. L. 393, 400 (2004) (observing that NAFTA and GATT "nondiscrimination obligations operate something like the 'dormant commerce clause' "). *But see* A. Dan Tarlock, *Safeguarding International River Ecosystems in Times of Scarcity*, 3 U. DENV. WATER L. REV. 231, 270-71 (2000) (acknowledging that GATT and NAFTA embody some dormant commerce clause principles but stating that "the issue is political, not legal").

[168] The water legislation proposed in 2003 would likely have violated the dormant commerce clause by imposing trade restrictions on water transfers on the basis of county. The original House version imposed no specific distance limitation on transfers, but it included an implicit limitation by restricting most interbasin transfers to within two adjacent counties. H.B. 237, 1 GA. HOUSE J. 2003, *supra* note 134, at 806. The Senate Committee version of the bill would have restricted transfers to immediately adjacent counties. H.B. 237, 2 GA. SENATE J. 2003, *supra* note 134, at 2122. These limitations could be discriminatory if Georgia precluded citizens of neighboring states from participating in the market.

[169] *See* Dellapenna & Draper, *supra* note 5, at 28 (calling permit trading "an irreversible step towards the potential loss of the state's authority and control of the waters of the rivers and aquifers by the State").

[170] The conference committee version of the 2003 legislation would have limited transfers to the same water basin in the same or adjacent county. H.B. 237, 2 GA. HOUSE J. 2003,

interest of maintaining hydrologic integrity on a watershed level, and it would not discriminate against out-of-state citizens if they were governed by the same rule as Georgia citizens. This limitation might be sufficient to avoid dormant commerce clause implications, though interbasin transfer allowances for metropolitan Atlanta could call into question the legitimacy of such limits.[171] Second, in relation to Florida and Alabama, Georgia could wait until the tri-state water dispute is resolved. A water compact between the states or an equitable apportionment decision by the Supreme Court would alleviate concerns about water export to Florida and Alabama. Preventing export to other states, or other countries, would remain problematic. Regardless of the approach, careful consideration of potential constitutional issues is imperative to ensure that Georgia maintains the ability to prevent export of its water resources.[172]

4. Interbasin Transfers and Location of Use. Interbasin transfers are particularly problematic in the context of a water market.[173] An interbasin transfer involves water that is withdrawn from one basin and then released into another basin.[174] Interbasin transfers are a concern in the management of water resources because such transfers can have adverse effects on the basin of origin.[175] From the perspective of the transferor basin, the use is 100% consumptive because none of the water will be returned to the basin after use.[176] This loss of water from the basin of origin has the potential to harm

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supra note 134, at 3951; *see also* Dellapenna & Draper, *supra* note 5, at 31 (suggesting restricting private water trading to geohydrologic boundaries of single watershed).

[171] *See* Kassel v. Consol. Freightways Corp. of Del., 450 U.S. 662, 671, 676-77 (1981) (striking down Iowa statute limiting truck lengths and discussing exemptions for Iowa cities).

[172] The Senate Committee version of H.B. 237 presented a third option in the final section of the permit trading provision: If the geographical limits were declared unconstitutional by a court, the entire trading paragraph would become invalid. H.B. 237, 2 GA. SENATE J. 2003, *supra* note 134, at 2122-23. While perhaps useful as a "savings clause," this provision is not an effective way to control the constitutional implications of water rights transfers.

[173] *See* SALIBA & BUSH, *supra* note 116, at 252-54 (explaining potential transfer effects and need for area-of-origin protection in general and concluding that policies may be needed to protect these values).

[174] *See* GA. JOINT COMPREHENSIVE WATER PLAN STUDY COMM., *supra* note 11, at 8 (defining interbasin transfer).

[175] *See* Draper, *supra* note 119, at 341 (listing effects of interbasin transfers on basin of origin).

[176] *See* GA. JOINT COMPREHENSIVE WATER PLAN STUDY COMM., *supra* note 11, at 8 (observing that all water from basin of origin is deposited into different basin).

economic prosperity, water quality, and public health.[177] Even though most individual transfers are too small to have serious impact, the cumulative effect of many transfers occurring through a market can have effects on the basin of origin that will not be taken into account by private transacting parties.[178] Interbasin transfers must be managed by the state, and a comprehensive interbasin transfer policy should be a prerequisite to any consideration of private permit trading.

An interbasin permit sale between water users in different basins will have a different effect from an interbasin transfer because it is not the water that is transferred, but merely the permit to withdraw the water. A market that does not place restrictions on transferring permits between different basins would allow changes in the patterns of use to occur through private transactions that do not consider hydrologic capacity.[179] If permits were sold into a basin facing a water shortage, the total quantity of use in that basin would increase, defeating the purpose of any management steps taken to maintain water levels. Such transfers would inhibit the state's ability to manage its water resources on a regional level.

5. Other Social and Practical Problems. The 2003 market proposals contained additional social and practical problems. Large-scale transfers out of agriculture to urban and industrial uses could potentially have adverse effects on the rural economies that the original Water Acts were designed to protect.[180] Because water permits add considerable value to land under the permit, rural communities could face a reduction of their tax base if water permits were sold out of agriculture.[181] Additionally, market opponents fear

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[177] Draper, *supra* note 119, at 341 (discussing effects of interbasin transfers).

[178] *Id.* at 346.

[179] By limiting permit sales on the basis of county lines, the permit trading provisions in the original H.B. 237 would have allowed permit sales to different basins because many counties occupy parts of more than one river basin. H.B. 237, 1 GA. HOUSE J. 2003, *supra* note 134, at 806. The conference committee version would have restricted transfers to those within the same river basin in the same or adjacent county. H.B. 237, 2 GA. HOUSE J. 2003, *supra* note 134, at 3951.

[180] *See* Fortuna, *supra* note 1, at 1062 (discussing adverse effects on transferor basin).

[181] *See id.* at 1061 (discussing possible negative effects on agricultural communities if value of water is significantly higher in urban communities).

that a water market would lead to an inequitable allocation of water dependant on economic wealth.[182]

On a practical level, introducing a system of transferability prior to improving management and developing a comprehensive statewide management plan puts the cart before the horse. Georgia is still in the process of evaluating the status of its water resources, measuring usage, and developing a sustainable plan to manage water.[183] Georgia is not yet prepared to deal effectively with the problems created by adding transferability to the structure of water management.

IV. REALLOCATION THROUGH STATE-BASED INCENTIVES

A third method for initiating the transfer of a water right is an incentive provided by the state for the surrender of an existing right. Experience with this method of reallocation has been limited, though the recent California Water Bank is the most direct example of such a system. The Flint River Drought Protection Act offers precedent in Georgia for state incentives to change patterns of water use.

A. THE 1991 CALIFORNIA WATER BANK[184]

The highly praised California Drought Emergency Water Bank (Water Bank) was the first large water trading system in the country in which the state acted as the primary broker for water transactions.[185] As an emergency response to water shortage caused by a five-year drought, the Water Bank was created by an executive

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[182] *See* Dellapenna & Draper, *supra* note 5, at 25-26 (discussing difference between "allocation efficiency" and "allocation equity").

[183] *See* James E. Kundell, *Georgia Water Resources: Where Are We; How Did We Get Here; and Where Are We Headed?*, *in* 1 PROCEEDINGS OF THE 2005 GEORGIA WATER RESOURCES CONFERENCE, *supra* note 19, at 1, 5 (discussing status of planning process).

[184] The term "water bank" is also used to describe a variety of processes other than state-brokered transactions, including as a mechanism to facilitate market transactions, as the process of storing water in an aquifer, or as a means to preserve wetlands. *See* Dellapenna, *supra* note 105, at 359-62 (discussing various types of water banks).

[185] Morris Israel & Jay R. Lund, *Recent California Water Transfers: Implications for Water Management*, 35 NAT. RESOURCES J. 1, 1 (1995).

order of the governor and implemented by the Department of Water Resources (DWR).[186] A "Water Purchase Committee" set a purchase price of $125 per acre-foot (AF) based on an estimation of net farm income, plus an additional amount to encourage farmers to sell to the Water Bank.[187] DWR entered into 348 purchase contracts and acquired 820,665 AF of water, primarily from farmers.[188] Roughly 60% of this water was then sold at $175 per AF to twelve entities, though the bulk of the water was sold to three urban water providers.[189] The Water Bank transactions involved the actual movement of water from the water-rich northern part of the state to the drier southern cities. Reallocation was prioritized based on "critical need," and purchasers had to demonstrate conservation programs and maximum use of current water supplies.[190] Transfers were temporary, and sellers did not forfeit long-term water rights for participation in the Water Bank.[191] Overall, the 1991 Water Bank was considered a successful emergency policy response to water supply conditions caused by a severe drought.[192]

A centralized water bank has both advantages and disadvantages. The primary advantages of the California Water Bank were the reduction in transaction costs and the coordination

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[186] *See* Brian E. Gray, *The Market and the Community: Lessons from California's Drought Water Bank*, 1 HASTINGS W.-NW. J. ENVTL. L. & POL'Y 17, 18-20 (1994) (describing water supply emergency due to drought and governor's creation of Water Bank).

[187] *Id.* at 21.

[188] Israel & Lund, *supra* note 185, at 7.

[189] *Id.* at 10-11. Three jurisdictions accounted for more than 80% of purchases. *Id.* at 11. The difference between total purchases and total allocations was due partly to additional water purchased to meet water quality requirements, and partly because DWR contracted to purchase more water than was demanded by purchasers. *Id.*

[190] *Id.* at 10-11.

[191] *See* Lawrence J. MacDonnell & Teresa A. Rice, *Moving Agricultural Water to Cities: The Search for Smarter Approaches*, 2 HASTINGS W.-NW. J. ENVTL. L. & POL'Y 27, 47 (1994) (discussing forfeiture concerns and legislative response).

[192] *See* Gray, *supra* note 186, at 47 ("[A] bold experiment that helped the state through . . . water crisis with few lasting negative consequences."); Richard E. Howitt & Henry Vaux, *Competing Demands for California's Scarce Water*, *in* WATER QUANTITY/QUALITY MANAGEMENT AND CONFLICT RESOLUTION 271, 285 (Ariel Dinar & Edna Tusak Loehman eds., 1995) (noting that Water Bank "exceeded all expectations"); Martha H. Lennihan, *The California Drought Emergency Water Bank: A Successful Institutional Response to Severe Drought*, *in* WATER LAW 127, 127 (Kathleen Marion Carr & James D. Crammond eds., 1995) (stating that Water Bank "worked remarkably well").

of the transfers with other water movements in the state.[193] These advantages, however, were not without cost. The lower transaction costs were the result of special emergency conditions: no environmental impact reports were required and DWR provided almost blanket approval to transfers without consideration for third-party effects.[194] For nonemergency transfers, these limitations are necessary to protect existing water rights holders, and as such, transfers would be subject to increased transaction costs.

Additional concerns arose with respect to the transferor regions and the source of the transferred water. Fifty percent of the water sold to the Water Bank came from farmers who temporarily took their lands out of production by fallowing land.[195] A RAND study found that the effects of the Water Bank on agricultural regions were not large in proportion to the overall economy, but that crop reductions adversely affected suppliers of farm inputs and processors of farm outputs.[196] Long-term transfers, however, could have more drastic adverse effects on selling regions by decreasing land values, contracting the farm economy, and weakening the tax base.[197]

An additional 32% of Water Bank supply came from water districts and farmers who substituted surface water usage for groundwater usage.[198] In such cases, the surface water was sold to the Water Bank, and farmers made up the difference by increasing groundwater withdrawals. The groundwater replacement withdrawals strained existing groundwater resources, threatening supplies and adding to an overdraft problem.[199] While feasible as a

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[193] *See* Israel & Lund, *supra* note 185, at 19-20 (discussing advantages of centralized water banks).

[194] *Id.* at 20; *see also* Dellapenna, *supra* note 105, at 362 (arguing that lack of consideration of third-party rights was critical difference from water banks in other states).

[195] *See* Kevin M. O'Brien & Robert R. Gunning, *Water Marketing in California Revisited: The Legacy of the 1987-92 Drought*, 25 PAC. L.J. 1053, 1076 (1994) (discussing lands taken out of production).

[196] LLOYD S. DIXON ET AL., CALIFORNIA'S 1991 DROUGHT WATER BANK: ECONOMIC IMPACTS IN THE SELLING REGIONS, at xi, 54 (1993).

[197] *See* O'Brien & Gunning, *supra* note 195, at 1080-81 (noting a two percent to three percent decline in agricultural business and discussing socioeconomic impacts of water transfers).

[198] *Id.* at 1076.

[199] *See* MacDonnell & Rice, *supra* note 191, at 47 ("[L]ocal solutions were adopted to monitor groundwater levels, limit the amount . . . pumped for replacement supplies, and

short-term measure, using groundwater replacement supplies over the long term could significantly decrease surface water supplies, depending on the degree of hydrologic connectivity.[200] Because it increases total usage, the groundwater substitution mechanism of the California Water Bank is not a sustainable policy for permanent water rights transfers.

B. STATE-BASED INCENTIVES IN GEORGIA

There is precedent for state-generated incentives for water rights modifications in Georgia. In 2000, the legislature enacted the Flint River Drought Protection Act, which provides an economic incentive program for modification of permits in southwest Georgia.[201] The purpose of the Act is to maintain in-stream flow by reducing withdrawals.[202] During drought years, the statute authorizes EPD to pay farmers to take acreage out of irrigation.[203] When a drought is declared, EPD holds a voluntary sellers' auction, allowing farmers to offer prices per acre at which they are willing to take acres out of irrigation for one year.[204] The 2001 auction eliminated irrigation from surface water sources on 33,101 acres at an average price of $135 per acre and a total cost of $4.5 million.[205] Funding for the payments came from the state's share of the tobacco settlement money.[206]

While the statute is designed to achieve a more efficient pattern of water use during a drought, there are no provisions for reallocation to new users.[207] The Act is designed merely to decrease

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impose a tax on . . . sellers to the bank . . . using groundwater as a substitute supply."); *see also* DIXON ET AL., *supra* note 196, at xiv (noting that groundwater substitution may also have economic impacts).

[200] O'Brien & Gunning, *supra* note 195, at 1073.

[201] O.C.G.A. §§ 12-5-540 to -550 (2001).

[202] *Id.* § 12-5-541(b).

[203] *See* Ronald G. Cummings et al., Enhancing In-stream Flows in the Flint River Basin 2-4 (Ga. State Univ. Andrew Young Sch. of Policy Studies, Water Policy Working Paper No. 2001-002, 2001), http://www.cviog.uga.edu/services/policy/environmental/georgiacommittee/whitepapers/enhancingflows.pdf (describing voluntary auction process).

[204] If the target acreage is not achieved, EPD may make further reductions on a "non-voluntary" basis. O.C.G.A. § 12-5-547 (2001).

[205] Cummings et al., *supra* note 203, at 3.

[206] GA. PUB. POLICY FOUND., *supra* note 4, at 4.

[207] O.C.G.A. § 12-5-541(b) (2001).

water usage among existing users, not to transfer water to new users. In its current form, the Act is limited and perhaps unsustainable financially.[208]

Despite its shortcomings, however, the Act could signal a willingness by the state to consider state-based incentives as a possible reallocation mechanism. Such an institution would have a number of positive features, and lessons could be drawn from the California experience. First, sellers would not be required to forfeit their water rights as a result of a transfer to the bank.[209] This feature would appeal to landowners who value water permits as a key component of land values. Second, such a bank would be in a position to deal with quantification issues for permits without clearly defined capacities. Quantification was an issue in the operation of the California Water Bank, although, in general, water transfers are allowed in California only where the right being transferred is a consumptive use.[210]

In Georgia, the use of an auction to identify sellers enabled the state to eliminate the maximum amount of irrigation at the lowest cost. The auction method of acquiring water for public purposes has rarely been used in the United States, even though it is generally more efficient than bilateral bargaining or standing offers.[211] The California Water Bank acquired water through standing offers rather than an auction, which resulted in DWR paying a higher price for water than may have been necessary.[212] The use of an auction in Georgia shows that the state has already implemented an efficient mechanism for acquiring water rights—the first step in water bank transfers.

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[208] *See* Cummings et al., *supra* note 203, at 3 (questioning whether legislature will replace depletions in fund).

[209] Water rights holders who participated in the Georgia Drought Protection Act were also not required to forfeit their water rights. O.C.G.A. § 12-5-546(b) (2001).

[210] O'Brien & Gunning, *supra* note 195, at 1058.

[211] *See* Benjamin M. Simon, *Federal Acquisition of Water Through Voluntary Transactions for Environmental Purposes*, 16 CONTEMP. ECON. POL'Y 422, 428-30 (1998) (discussing alternative mechanisms for acquiring water).

[212] DIXON ET AL., *supra* note 196, at xiv (finding that there would have been many willing sellers for less than $125 posted purchase price).

C. TAX INCENTIVES AND USER FEES

Direct payments to water users are not the only form of state-based incentives. Tax incentives and user fees are indirect mechanisms that the state could use to provide incentives to change patterns of water usage.[213] Tax incentives would function much like the direct payments of the California Water Bank, except that participants would be compensated through the tax system instead of by direct payments. Increased user fees were employed as a central feature of decentralization reforms in Australia in the early 1990s.[214] The price increases were designed to ameliorate the externalities caused by overuse, including water-logging and salinization of land and streams.[215] The goal was to achieve greater cost recovery for capital investment by the state and encourage a more efficient pattern of usage.[216] For Georgia, tax incentives or user fees would be additional policy options for providing state-based incentives.

V. MOVING FORWARD

Georgia must improve its water management system before instituting new mechanisms for transfers or reallocation. While reallocation may enable the state to achieve the highest and best use of scarce water resources, there are potential side effects associated with each method of reallocation. Georgia should move cautiously in implementing any new system for reallocation, especially voluntary transfers. First, the state must improve its existing structure of water management by developing a comprehensive statewide water management plan that better coordinates existing law and administration and improves knowledge of current usage and supply. Second, the state should only introduce new means for reallocation in light of specific regional problems and clearly defined allocation objectives. Any

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[213] *See* Dellapenna & Draper, *supra* note 5, at 23 (suggesting that economic incentives such as taxes or fees can be appropriate way to increase efficiency).

[214] *See* Musgrave, *supra* note 145, at 432 (describing price reforms in Australian states).

[215] *Id.* at 431.

[216] *Id.* at 432.

new institutions should be narrowly crafted to meet these supply objectives. This requires regional planning and management as a key component of the comprehensive statewide water management plan.

A. FIRST THINGS FIRST

1. Develop a Comprehensive Statewide Water Management Plan. Prior to considering mechanisms for reallocation, the state should develop and implement a comprehensive statewide water management plan. Under this plan, Georgia should begin to manage surface water and groundwater conjunctively and develop sustainable usage plans for each watershed. Ideally, the legislature would provide additional funding to EPD to improve its oversight of water resources.

Georgia should also attempt to bring farm permits fully within the permit system. First, the state should introduce provisions for forfeiture for nonuse of farm permits. To account for periodic crop rotation in agriculture, it may be appropriate to impose less stringent conditions for forfeiture on farm permits than the two years provided to nonfarm uses, but in general, permits that are unused for lengthy periods of time should be surrendered to the state. Second, the state should clarify that all permit rights are merely usufructuary rights, and not fully private property. Third, all permits should have specific quantity and duration limitations. These requirements will clarify water rights and bring farm permits in line with municipal and industrial permits.

2. Improve Knowledge of Water Usage and Supply. It is also imperative that Georgia improve its knowledge of usage and supply before considering mechanisms for reallocation. Accurate and reliable information on water use and supply is needed to help understand the scope of specific supply problems. Even though the state is nearing completion of scientific studies on the water capacity of the coastal and Flint River Basin regions, the majority of farm uses in southwest Georgia remain unmetered. It would be a mistake to introduce permit trading or other new institutions at

a time when the state is still figuring out how much is being used.[217] Georgia must determine how much water is being used and how much should remain in the rivers and aquifers before making drastic changes to the law of water allocation.

3. Consider Costs and Impose Adequate Limitations. As discussed, there are potential adverse consequences associated with any mechanism for reallocation in Georgia, especially prior to further development of a comprehensive statewide management plan. With administrative reallocation, it is difficult for an agency to determine the most efficient pattern of allocation, and overly aggressive permit modification could lessen the investment security of productive water users. For reallocation through state-based incentives, there is the problem of ensuring that any such program is financially sustainable. With any type of reallocation, rural economies could suffer if large scale transfers are made out of agriculture to municipal and industrial users.

Market-based transfers raise the broadest range of issues. If Georgia is to consider any market mechanisms for reallocation of water rights, the state must impose adequate limitations on transfers. First, the state must ensure that water rights in Georgia remain usufructuary by clarifying the scope of private property rights in water permits prior to reallocation. Second, policymakers must avoid constitutional implications that could limit the state's ability to control the export of its water resources. Third, the state must adopt an appropriate set of standards for approving or facilitating transfers. This set of standards must take into account potential effects on third parties, the public interest, and the state's water resources. Fourth, the state must make sure that any system of reallocation does not result in an increase in use. All permits must be quantified before reallocation can occur. Quantification should include not only a maximum amount per day of withdrawal, but also the seasonality of use and the consumptive nature of the use. Fifth, the state must adopt a comprehensive strategy for monitoring and limiting interbasin transfers. Sixth, any system of

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[217] *See* Stacy Shelton, *Growth Often Depends on Water; State Debates Use of Permits*, ATLANTA J.-CONST., Apr. 14, 2003, at C1 (containing comments by Andy Keeler, environmental economist at University of Georgia).

reallocation should be open to the public so that third parties potentially affected by any reallocation can file comments and objections to the agency, with the availability of judicial review. Such protections are necessary to ensure that the externalities of transfers do not outweigh the economic gains.

B. DEVELOP INSTITUTIONS IN LIGHT OF SPECIFIC PROBLEMS AND OBJECTIVES

1. Clearly Define Reallocation Problems and Objectives. Institutions for water rights transfers should be considered only after identifying regional water supply problems. Recent water market proposals were designed specifically to address the problems of the Flint River Basin,[218] but the legislation introduced in 2003 would have enacted one market system for the entire state without consideration for the differing conditions in each region. The 2003 legislation was also disjointed from the problem because it proposed permanent transferability as a solution to a temporary moratorium on new permits. Further, because the objectives of the 2003 proposals were not clearly defined, citizens from every corner of the state concluded, justifiably or not, that the primary objective of the bill was to allow large special interest permit holders to reap windfall profits by selling permits that had been granted to them at no cost.[219]

In the future, discussions on transfer mechanisms should consider specific problems on a regional basis. In addition to increasing knowledge gaps about supply and current usage, the state must also decide what it hopes to achieve through transfers.

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[218] *See* Cummings et al., *supra* note 64, at 2 (discussing proposals relevant to Flint River Basin).

[219] *See* Tom Barton, Op-Ed., *Don't Hang Georgia Out to Dry*, SAVANNAH MORNING NEWS, Mar. 5, 2003, at 10A (lawmakers "aiding and abetting the heist" of "potential bottom-line bonanza"); Jay Bookman, Op-Ed., *House's Water Proposal Drips with Pretense*, ATLANTA J.-CONST., Mar. 6, 2003, at A15 (claiming advocates of H.B. 237 are dishonest about motives); Mary Landers, *Bills Offer Competing Ways to Manage Water*, SAVANNAH MORNING NEWS, Mar. 8, 2003, at 1C (allowing sale would be "unintended windfall for large corporate permit holders"); Editorial, *Selling Excess Water Shouldn't be Allowed*, MACON TELEGRAPH, Mar. 12, 2003, at 10A (fearing "greedy developers" in and around Atlanta); Editorial, *Water Management Issue Too Important for Haste*, ATLANTA J.-CONST., Apr. 9, 2003, at A22 (noting potential for "tidy profit" by wood products industry).

Who needs additional water supply? Who is offering to cut usage to give up water that is currently allocated and in use? How much reallocation is necessary? Is there a need for reallocation between similar uses or between different types of uses? Is there a need for reallocation within a narrowly defined hydrologic distance, or a demand for increased interbasin transfers? The scope of regional reallocation objectives should dictate the discussion of the mechanisms available as an appropriate solution.

2. Consider Mechanisms in Light of Objectives. Many problems may be solved through conservation and better management and will not require introducing new mechanisms for water rights transfers to meet allocation objectives.[220] Unlike the arid western states, Georgia is blessed with abundant rainfall, which gives the state more options in meeting water supply needs. The state already has tools for reallocation within the existing regulatory structure, such as power to modify permits and revoke permits for nonuse. Bringing farm permits within the system will improve the effectiveness of these tools. In addition, the state has a record of facilitating some large permit transfers through existing institutions in areas where water is necessary for continuing economic growth.[221] Where possible, Georgia should seek to meet supply objectives without introducing new mechanisms for transferability.

State-based incentives could be considered for solving the problem of "sleeper" permits.[222] Eliminating the potentially thousands of farm permits that are currently not in use would bring permitted capacity in line with actual use and would perhaps free up water to be issued to new users.[223] Rather than revoking such permits for nonuse, it might be cheaper and easier to recover these permits if the state were to offer a tax incentive to farmers who returned excess capacity to the state. Under such a scheme, EPD

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[220] *See* Mandy Schmitt et al., *Meeting Water Supply Needs While Protecting the Economic and Ecological Integrity of Georgia's Water Resources*, *in* 1 PROCEEDINGS OF THE 2003 GEORGIA WATER RESOURCES CONFERENCE, *supra* note 23, at 38, 38 (advocating statewide planning and conservation to meet supply needs).

[221] *See* Shelton, *supra* note 217 (discussing transfer of one million GPD from International Paper Co. to cities of Pooler and Savannah and company's plan to relinquish additional five million GPD by 2005).

[222] *See supra* notes 72-80 and accompanying text (discussing revocation for nonuse).

[223] *See supra* notes 72-80 and accompanying text.

would not have to engage in the complex administrative task of determining which permits should be revoked or modified, because individual water users would have an incentive to make a projection of their own future water needs. Nonusers would have a financial incentive to surrender their permits to the state, and actual users would have an incentive to take advantage of cost-effective conservation methods. These incentives could be strengthened by first providing a fixed period in which the tax incentive could be realized, followed by a period in which EPD would begin to revoke permits for nonuse administratively. A fixed period system would provide permit holders with a window in which to realize a benefit from turning over a permit, after which the unused permit could be revoked without compensation. Given the vital need to bring unused permits back into the system, a system of tax incentives, as compared to administrative revocation, would be better for farmers and possibly more cost effective for the state.

If water supply objectives call for reallocation within agriculture and a narrowly defined hydrologic distance—that is, farmer-to-farmer transfers within a single river basin—then new institutions for voluntary water rights transfers may be appropriate. Under these circumstances, transferability is less problematic because the type of use remains generally the same with only a reasonable change in location of use.[224] There may be potential gains from trade with manageable transaction costs and externalities. When reallocation is in response to short-term drought conditions, allowing temporary transfers or leasing of water rights may be more appropriate than permanent transfers. Some form of an agricultural water market could possibly be successful if transactions are adequately monitored by the agency. It is imperative, however, that the state resolve the water market issues discussed in Part II prior to introducing even limited transferability. As a preliminary step, the state must proceed with the development of the comprehensive statewide water management plan.

Reallocation between different types of uses must be more strictly regulated. This intersector reallocation would involve a change in

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[224] Not all agricultural uses are equally consumptive, and so even transfers within agriculture will require agency management. Cummings et al., *supra* note 64, at 31 n.49.

usage—for example, from agricultural to municipal use. Changing use introduces new variables into the transaction, increasing transaction costs and potential externalities. A change from a less consumptive use to a more consumptive use will, by definition, consume more water even if the amount diverted remains constant. Seasonality of use is potentially problematic for reallocation out of agriculture, because while agricultural irrigation occurs mostly in summer months, municipal or industrial use continues year-round. Transferring a farm permit—quantified by gallons per day—to a different sector has the potential to result in a much larger total yearly withdrawal rate. In addition, large-scale transfers out of agriculture could have negative economic impacts on rural communities that depend on farm economies. Though these added complications of intersector transfers do not mean that such reallocation should never occur, they do suggest that a more active state role is required to ensure that there are no adverse impacts on water resources and local communities. A market with minimal regulation is probably not sufficient for managing such transfers.

Reallocation that involves an interbasin transfer of water is an even more problematic type of transfer.[225] Although interbasin transfers are necessary in certain circumstances, an effective management policy would limit movement of water between basins whenever possible. Such transfers must involve a high degree of administrative oversight. Unregulated market transfers between private parties that also involve interbasin transfers should have no place in Georgia's system of water allocation.

Perhaps the most fundamental limitation of any system for reallocation is that it will not create new water sources. Conservation and management will remain paramount; transfers alone can never be an effective solution to water supply problems.[226] Through the comprehensive statewide water management plan,

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[225] The 2003 water legislation would have restricted most new interbasin transfers, and many water experts pushed for even tighter restrictions. H.B. 237, 2 GA. HOUSE J. 2003, *supra* note 134, at 3955, 3961 (restricting most interbasin transfers to two adjacent counties with exemption for Metropolitan North Georgia Water Planning District in Atlanta metro area); *see also* GA. WATER COAL., *supra* note 57, at 11 (advocating for more comprehensive restrictions on new interbasin transfers).

[226] *See* Israel & Lund, *supra* note 185, at 30 ("Water transfers alone will rarely resolve a region's water supply problems in an economical manner.").

Georgia will need to improve its management of water so that new supply can be gained through better use of existing resources.

VI. CONCLUSION

As Georgia continues to experience increasing demands for finite water resources, there may be a need to introduce new mechanisms for transferring water rights to higher-valued uses. Fundamentally, there are three ways to induce the transfer of a water right. First, the state can use its regulatory authority to modify or revoke existing permits for reallocation to new permit applicants. EPD is granted considerable authority under current Georgia law, though overuse of such power could create investment insecurity among water users. Second, water rights transfers can be induced by an incentive provided by the transferee through private trading in a water market. Third, the state could provide an incentive for current users to discontinue use to free up capacity for reallocation. All three categories of reallocation, or any hybrid, require active agency participation and effective administration.

In 2003, the Georgia legislature considered a proposal to introduce water marketing in areas of the state facing a moratorium on new permits. This proposal not only put the cart before the horse by proposing a water market before the development of the comprehensive statewide water management plan, but it also failed to provide adequate protection to third parties and the public interest. The bill was rejected due to a variety of concerns: constitutional issues which could have limited the state's ability to restrict water export, trading in unquantified agricultural permits which could have greatly increased withdrawals, inadequate restrictions on interbasin transfers, potential effects on agricultural communities, and failure to adopt a safe yield requirement.

Georgia must continue the development of its comprehensive statewide water management plan before introducing a complex variable such as reallocation into the system. The success of any new reallocation institutions will depend on having an effective management system already in place. This process should begin by completing steps to acquire adequate scientific knowledge of water resources and practical information on agricultural use. Farm

permits should be brought within the regulatory system, and surface water and groundwater should be managed conjunctively. Through these steps, the state can decide if and to what extent reallocation of water rights may be needed to meet water supply needs.

Rather than making a dichotomous choice between having a water market or not having a market, Georgia policymakers should consider a broad range of transferability mechanisms in light of regional problems and specific water supply objectives. Though a properly controlled market may be an effective solution for reallocation between farm users within a single river basin, a market is probably not an appropriate mechanism for reallocation between sectors or involving interbasin transfers. Different reallocation objectives will call for different reallocation mechanisms, and policymakers should seek regional solutions instead of a single statewide system. Policymakers should also prioritize conservation and better management, because reallocation alone will never provide a solution to all water supply issues.

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