

**QUANTIFYING RUNOFF RIGHTS TO CLOUD SEEDING AUGMENTED SNOWFALL:
THE ASCE MODEL STATE WATER CODE**

by

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ABSTRACT

Snowpack augmentation by cloud seeding is sponsored by organizations seeking to increase runoff. If they wish to obtain the prior right to use such increased runoff as against other claimants to the water, they must follow state water rights allocation laws. A few weather modification liability claims cases suggest that persons developing water through weather modification may have a legal right to such augmented streamflow. Additionally a few states provide by statute for water rights to added runoff. But as yet there is no case or statutory law addressing the manner in which the quantity of such water is determined. The recently completed American Society of Civil Engineers Model State Water Rights Codes have established water rights quantification mechanisms. Using techniques of hydrology, meteorology, and civil engineering, water rights claimants under the codes would provide data from a statutory list of relevant factors to state water resources allocation decision makers so they can determine the extent and priority of the augmented water supply and officially recognize a right for that amount of water.

INTRODUCTION

Weather modification projects are sponsored for economic reasons. One sponsor put it this way: "[T]he Primary color of Cloud Seeding is GREEN! - Crops and Dollars." (Eastgate, 1977). Those who pay for snowpack enhancement projects seek to generate additional water for hydroelectric power generation, agriculture, industry, and domestic uses. Other than projects intended to benefit winter sports activities (Howe, 1971), sponsors tend to be located downstream from snowpack enhancement project areas. In order to protect their investment, they need to be assured that the additional water harvested through weather modification will be available to them. To obtain the prior right to the increased runoff, sponsors should follow applicable state water rights allocation procedures. Economic benefits are made possible by water rights legal recognition.

The Model State Water Rights Codes of the American Society of Civil Engineers (ASCE) recognize the possibility of acquisition of legal rights to increased runoff and provide the mechanism for quantification and prioritization of those rights (Task Committee, 1995). This paper discusses that chapter of the codes in the context of snowfall augmentation. It deals first with existing state law relating to water rights and weather modification; it then turns to a discussion of the model code project and the place of weather modification in the codes; and finally it addresses treatment by the codes of water rights quantification and priority.

WATER RIGHTS AND WEATHER MODIFICATION

Weather modification law has not focused upon water rights. Litigation has given rise to judge-made law dealing with legal liabilities of cloud seeders. Legislation has dealt with regulating weather modification activities and creating mechanisms for public funding of them. Consequently not much can be found in the law books about atmospheric water rights. But in some liability cases judges have made statements which relate to water

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rights and there are a few state laws on the subject. Consideration of these cases and statutes demonstrates how far the ASCE codes go beyond existing law.

Liability Cases

There are three judicial opinions from which language can be quoted that tells of atmospheric water rights. In the earliest of them, the 1950 case of *Slutsky v. City of New York*, the judge said that property owners "clearly have no vested property rights in the clouds or the moisture therein." But a Texas judge less than a decade later stated that the landowner has a right to "such precipitation as Nature deigns to bestow . . . to such rainfall as may come from clouds over his own property that Nature, in her caprice, may provide." Not long thereafter a Pennsylvania court asserted that "every landowner has a property right in the clouds and the water in them." It went on to indicate that in its judgment the right was subject to "weather modification activities undertaken . . . under . . . governmental authority." Finally it noted that a seeder cannot "determine for himself what his needs are and produce those needs by artificial means to the prejudice and detriment of his neighbors." (Davis, 1968).

These decisions are rather murky guidance for someone seeking to obtain a water right to streamflow enhanced by artificial snowpack augmentation. None carry the prestige of having been made by the highest court of the jurisdiction in which they were decided. Obviously they are in conflict with each other. Moreover all three opinions are written in a liability law context and speak to rights in the atmosphere, not about claims to runoff attributable to weather modification.

Statutes

Colorado, a state following the prior appropriation surface water doctrine, has a section in its weather modification law which has been interpreted as allowing an application to appropriate water harvested by precipitation enhancement. Utah, also an appropriation state, has similar statutory language, but it has been interpreted as assigning the right to the augmented portion of a watercourse to the next claimant in line whose priority has not otherwise been filled. North Dakota's law simply says that artificial precipitation will be legally treated like natural precipitation. Since North Dakota is a riparian rights state, this would benefit riparian landowners who may or may not be sponsors of the cloud seeding (Davis, 1994b).

Colorado's law provides a way the sponsor of cloud seeding could protect its investment by getting a water right. North Dakota, which would benefit riparian landowners, and Utah's which would benefit an appropriator who otherwise would have gone dry, do not provide incentive to pay for snowmaking. None of the three laws deals with quantification of the claim to the water. Only Utah's provision, as interpreted, deals with the priority of the claimant's right. Other states simply do not address in any way water rights issues in their weather modification laws.

MODEL CODE PROJECT

The American Society of Civil Engineers has had a long interest in both water law and weather modification. Those persons who initiated and have directed the model code project under ASCE sponsorship have served on the Water Laws Committee of the ASCE Water Resources Planning and Management Division and the Weather and Climate Change Committee of the Irrigation and Drainage Division (ASCE, 1994). It should not be a surprise then when they incorporated a chapter on precipitation enhancement and water rights in their work product.

History

The Water Resources Division authorized creation of a task committee on state water codes in 1989. During 1990-91 and each of the following three years that task committee completed drafts of model state water rights codes.

The follow-up committee to the task committee is the ASCE Water Regulatory Standards Committee which currently is converting the codes into formal engineering standards. When these standards are approved by ASCE, they will represent its view about proper regulation of water resources development and management, including regulation of weather resources as well as surface water and underground aquifers (Davis, 1994a).

Participants

Over 120 persons have worked on the model code project as drafters, reviewers, and advisors. Most are engineers who have practical experience working with water and water laws. About twenty are lawyers (some of who also have engineering degrees). Also there are economists, geographers, sociologists, and other professionals with backgrounds in water resources. There are academics and persons working with law and engineering firms of varying sizes. Employees of international, federal, state, and local agencies have been involved. Indian tribes, environmental groups, and water user organizations have participated (Davis, 1994a).

Products

Efforts to secure adoption of earlier model water rights legislation prepared for consideration by state legislatures have not been very successful (Beck, 1991). One probable reason is that no state has a law precisely like that of any other state and no state would wish to do so. Recognizing this problem, the task committee members prepared the first draft with dual tracks--one for consideration by riparian states and the other by prior appropriation jurisdictions. By the third draft, task committee members decided to produce two codes--a regulated riparian code (Dellapenna, 1994) and an appropriation code (Matthews, 1994). The current approach in disseminating the codes to legislatures is to offer them as menus from which selection could be made of those parts thought to be helpful. One such particularly useful portion of the draft legislation should be Chapter IX, Part 2 on atmospheric water management.

QUANTIFICATION

The basic proposition of the ASCE codes on atmospheric water rights is that water derived from weather modification "becomes part of the State's basic water supply subject to allocation and regulation in accordance with the provisions of the Code." Water rights depend not upon land ownership, or the previous priority of the claimant to water in the watercourse, or operating a project to enhance precipitation, but instead upon application to the state regulatory agency and receipt of its approval. This regulated rights scheme is based upon delegation of permitting authority to the agency, subject to legislative standards within which the power may be exercised. The agency works with data referred to in the code to make its analysis of the quantity of the water right.

Data

The relevant factors, as may be appropriate, which the regulatory agency should consider in reaching a decision about quantification are listed by the code as:

- (i) physical and statistical analysis of historic streamflow and augmented streamflow;
- (ii) analysis of precipitation data in the project area and in control areas;
- (iii) computer simulations;
- (iv) radar measurements;
- (v) chain of events research; and
- (vi) such other technology or technique that currently exists or may be available in the future which comports with sound engineering and physical principles.

This permits use of data from the entire gamut of meteorological and

hydrological instrumentation. It would include snow depth and snow water content information (Murphy, 1995). Decisions, however, would be correct only to the extent that data is available and accurate. Instrumentation is critical to water rights decision making as well as to other aspects of weather modification regulation (Griffith et al, 1995).

Analysis

The applicant for quantification of a water right bears the burden of proof of the amount of augmented water. This means first that the applicant (usually the sponsor of the project) has the obligation to bring the data to the administrative agency. The weather modifier in the normal course of events would have much of the meteorological data, but would not necessarily have the hydrologic information unless the contract between the cloud seeder and sponsor calls for the operator to collect that sort of data too. The burden of proof requirement also incorporates the notion of burden of persuasion. The applicant must convince the agency that the numbers are adequate and accurate.

In its analysis, the agency considers the factors and weighs them. It determines what is and what is not appropriate to incorporate in its analysis. Then it makes its decision. Obviously, calculations made by the applicant will be of great assistance to the agency, but the responsibility for its decision is delegated to it. Hopefully the agency will have adequate and trained staff to make proper quantification decisions.

PRIORITY

Water right priority is critical in western prior appropriation states. A senior right is far more valuable than a junior one because available water diverted in the order of priority. Such juniors as holders of rights only from flood waters often go unserved because flows are not adequate to meet the perfected rights of those senior to them and of them (Getches, 1992).

The model code provides that the allocation date (and hence the priority date) for water developed by atmospheric water resources management "shall be the later of (a) the date of commencement of the atmospheric water management project, (b) the date of application for a water permit under this Code, and (c) the date of application for an atmospheric water management permit if such a permit is required."

CONCLUSION

Instrumenting snowfall and snowpack has come of age during the same period of time in which weather resources management has evolved. The model codes presuppose that the technology to enhance snowfall exists or certainly will be forthcoming and that there is or will be technology to measure the enhanced runoff. Adoption of code weather modification provisions will mean that the law can accommodate such modern technology. Snowpack enhancement project sponsors will be able to get perfected water rights and thus legally protect the benefits for which they have paid by supporting the seeding costs.

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