

Water Law Atlas

by Thomas A. Garrity, Jr. and Elmer T. Nitzschke, Jr.
New Mexico Chapter of the Federal Bar Association
in cooperation with
State Bureau of Mines and Mineral Resources
New Mexico Institute of Mining and Technology



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Water Law Atlas

a water Law Primer 1968

by Thomas A. Garrity, Jr. and Elmer T. Nitzschke, Jr.
Foreword by William E. Bertholf

Sponsored by New Mexico Chapter of the Federal Bar Association

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CONTENTS

FOREWORD

INTRODUCTION

SURFACE WATERS

- Map 1 - Water Law Doctrines
- Map 2 - Appropriation States
- Map 3 - States Recognizing both Doctrines
- Map 4 - Riparian States
- Map 5 - Surface Water Summary

GROUND WATER

- Map 6 - Water Law Doctrines
- Map 7 - Riparian Right - Absolute Ownership-English Rule
- Map 8 - Riparian Right - American Rule
- Map 9 - Appropriation Doctrine
- Map 10 - Ground Water Summary

GENERAL INFORMATION

- Map 11 - Federal Lands
- Map 12 - Average Annual
Rainfall
- Map 13 - Elevation
- Map 14 - Population
- Map 15 - Irrigated Lands
- Map 16 - Value of Farm Products
- Map 17 - Surface Water Legislation
- Map 18 - Ground Water Legislation
- Map 19 - Permits Required
- Map 20 - Priorities and Preferences
- Map 21 - Weather Modification

SELECTED BIBLIOGRAPHY

FOREWORD

The Federal Bar Association's Committee on Mines, Minerals, and Natural Resources was fortunate in having Professor Charles E. Jacob, New Mexico Institute of Mining and Technology, call attention to a study report titled, "Working Papers," covering water law of the 50 states prepared by the Department of Water Resources of North Carolina.

The "Working Papers" of the Department of Water Resources of North Carolina contain a wealth of material on water law. The problem of developing a format for preparing a publication based on the material and adding material to round out the subject matter was undertaken by Thomas A. Garrity, Jr., of the U. S. Department of Interior, Office of the Solicitor,

Albuquerque, New Mexico. A subcommittee was formed to prepare a monograph, and Elmer T. Nitzschke, Jr., of the aforesaid Office assisted Mr. Garrity in the work of the subcommittee.

After reviewing the types of publications currently appearing on water law, the subcommittee decided that some form of condensation of the materials would substantially aid the student and ordinary practitioner. The subcommittee is to be commended for the very effective organization and presentation of the materials herein. This atlas of water law of the United States is a contribution of lasting benefit.

William E. Bertholf
Deputy Chairman

Committee on Mines, Minerals and
Natural Resources of the Federal Bar
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Socorro, New Mexico

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INTRODUCTION

Water is like a living thing. Essentially all of it that is usable is in motion — a part of the vast circulatory system known as the hydrologic cycle. In this cycle water evaporates wherever it is exposed to air, but especially from the oceans; rises into the atmosphere; travels as part of vast air masses over ocean and land; is condensed when an air mass rises to pass over another or over a mountain range; and falls as rain or snow

McGuinness, The Water Situation in the United States with Special References to Ground Water, 3-6 (USGS, 1951).

Water is essential to life, and conflicts over water have existed since the dawn of civilization. Society relies on the law to settle such conflicts. Water law, as treated in this book, is concerned with the rights of individuals to use surface or underground water. Other water problems, such as flood or unwanted water, which might be included in the broad definition of water law, will not be covered.

Water law can be considered a branch of property law. Water law governs individual rights to use and enjoy property. But water, unlike land, does not remain stationary. It is in motion; it ignores land property lines.

A water right is a special kind of property.

The actual water while it is flowing in a stream cannot be owned. But, the right to use water is subject to private ownership. This right to use water - this usufructuary right - is, nonetheless, a property right. In some states it is theoretically possible to own underground water while it is in place. This doctrine of absolute ownership of in situ underground water merely makes it easier to recognize a water right as a property right.

The desire to own property is extremely powerful, if not basic to the human animal. Even if it were desirable, it would be just about impossible to change the legal concept of a water right as a property right. So, the emphasis on the property aspect of water rights is quite necessary. Any attempt to solve a water management problem without taking into account the property nature of water rights will be doomed to failure. Most water administrators are technically trained and they are prone to attack water management problems with the standard techniques of applied science. Often the resulting technically correct solution conflicts with the concept of property rights. When the technical view of water, despite its scientific correctness, conflicts with the property nature of water, it is usually the technical view that is relegated to second place.

Once the property nature of water is re-

cognized, plans may be formulated to bring the law of water rights more in line with the scientific and economic facts of life. The rights of all property owners are subject to qualifications and to regulation by the state. There is no such thing as absolute ownership in the sense that an owner can do as he pleases, even if his action is injurious to other individuals or to the public interest. Under the police power of the state, legislation could be enacted to protect the public welfare. For example, the waste concept could be introduced to water law. Waste has been discussed in a few water cases, but the waste concept has never been utilized to the extent it has been used in the oil industry. Laws prohibiting physical waste would require the efficient use of water. Such laws would be particularly useful to force irrigation users to adopt more efficient practices, especially in the construction and maintenance of their ditches.

The economic waste concept would be more difficult to apply. In relationship to water law, the economic waste concept would result in priorities among various uses. For example, a party could be irrigating as efficiently as possible, and therefore not physically wasting water. But, if irrigation were a less economic water use than some other use, such as an industrial use, the more economic use would be given preference. There is some application of the priority on the basis of use concept; however, it is not widespread. It will be difficult to introduce in areas where most of the avail-

able water rights are owned by private parties. In these areas, the water rights are vested property rights and any attempt to decrease their value through state action would be, in effect, an inverse taking of property. Where water is still available, legislation could be enacted setting up use priorities governing the future acquisition of water rights.

It is possible, and may someday be practical, for the state to purchase vested but uneconomic water rights. The state could then administer the purchased rights on a sound economic basis.

If a water right could be used anywhere within a watershed or basin and not restricted to a specific parcel of land, the open market might insure the most economic use of water. That is, if a water right could be bought and sold on an exchange much as stock in a corporation is traded, the most economic water user in theory would pay the highest price. Some states approach this plan by almost automatically granting changes in points of diversion and in uses within reasonably definable basins.

Much of the foregoing has been in the realm of speculation as to how water management problems may eventually be handled. The following pages will attempt to explain basic features of water law as it now exists in the United States. An atlas format is used since it seems best suited to a concise, basic presentation of the information. Accordingly, the principal feature of this book is a series of maps showing how the states solve particular prob-

lems of water law. With each map is a discussion of the problem, and the solutions used by the states. Every attempt has been made to treat water law as a series of basic concepts, and to explain each concept in an accurate and easy to understand manner. The result is in-

tended to be a concise, broad-brush but accurate, coverage of water law for the general practitioner who has only an occasional contact with water problems and to the many engineers, technicians, and water administrators who have an interest in water law.

SURFACE WATER

MAP 1 — WATER LAW DOCTRINES

In all fifty states, water law is based on either the riparian or appropriation principle, in-so-far as private water rights are concerned.

The riparian principle bases the right to use water, which is a real property right for most purposes, on ownership of land next to, or contiguous to surface water. Under the common-law Riparian Doctrine, the right to use water is inseparably annexed to the soil. Use does not create the right, and disuse does not destroy or suspend it. Map 1 shows that all states east of the 98th meridian, except Mississippi and Florida, follow the Riparian Doctrine exclusively.

All states west of the 98th meridian, as well as Mississippi and Florida, recognize the appropriation principle. Under the Appropriation Doctrine, a water right is based upon the beneficial use of water. The first to appropriate and use water has a right superior to the rights of later appropriators.

A riparian water right is based on ownership of land next to water; is independent of the use or non-use of the water; and if the use is a consumptive use is correlative with other riparian users from the same source, regardless of which user first used the water. An appropriation right is independent of the location of the land with respect to the surface water; is based exclusively on the beneficial use of water; and recognizes priorities among users according to the first in time, first in right, maximum.

Private water rights are based on the riparian principle of land location, or on the appropriation principle of prior beneficial use. A third principle bases water rights on need. Indian water rights, federal reserved rights, and, to some extent, municipal water rights are based on need. The various aspects of the need principle are beyond the scope of this report.

SURFACE WATER

MAP 2 — APPROPRIATION STATES RECOGNIZING RIPARIAN DOCTRINE

Of those states recognizing the Appropriation Doctrine, nine - the eight mountain states and Alaska - follow the appropriation principle exclusively. The West Coast states and the Great Plains border states apply both the riparian and the appropriation doctrines.

The Appropriation Doctrine is well suited to areas which require the consumptive use of water. A consumptive use is one that takes a substantially larger quantity of water out of the stream system than is returned after the water is used. Many water uses do not consume water to any real extent. For example, for centuries the major use of flowing stream water in humid areas was to furnish power for mills. Such a use consumes almost no water. On the other hand, any agricultural use consumes a substantial amount of water. In humid areas it is not necessary to irrigate. But in arid and semiarid regions irrigation is a way of life. Irrigation is only necessary where there is a

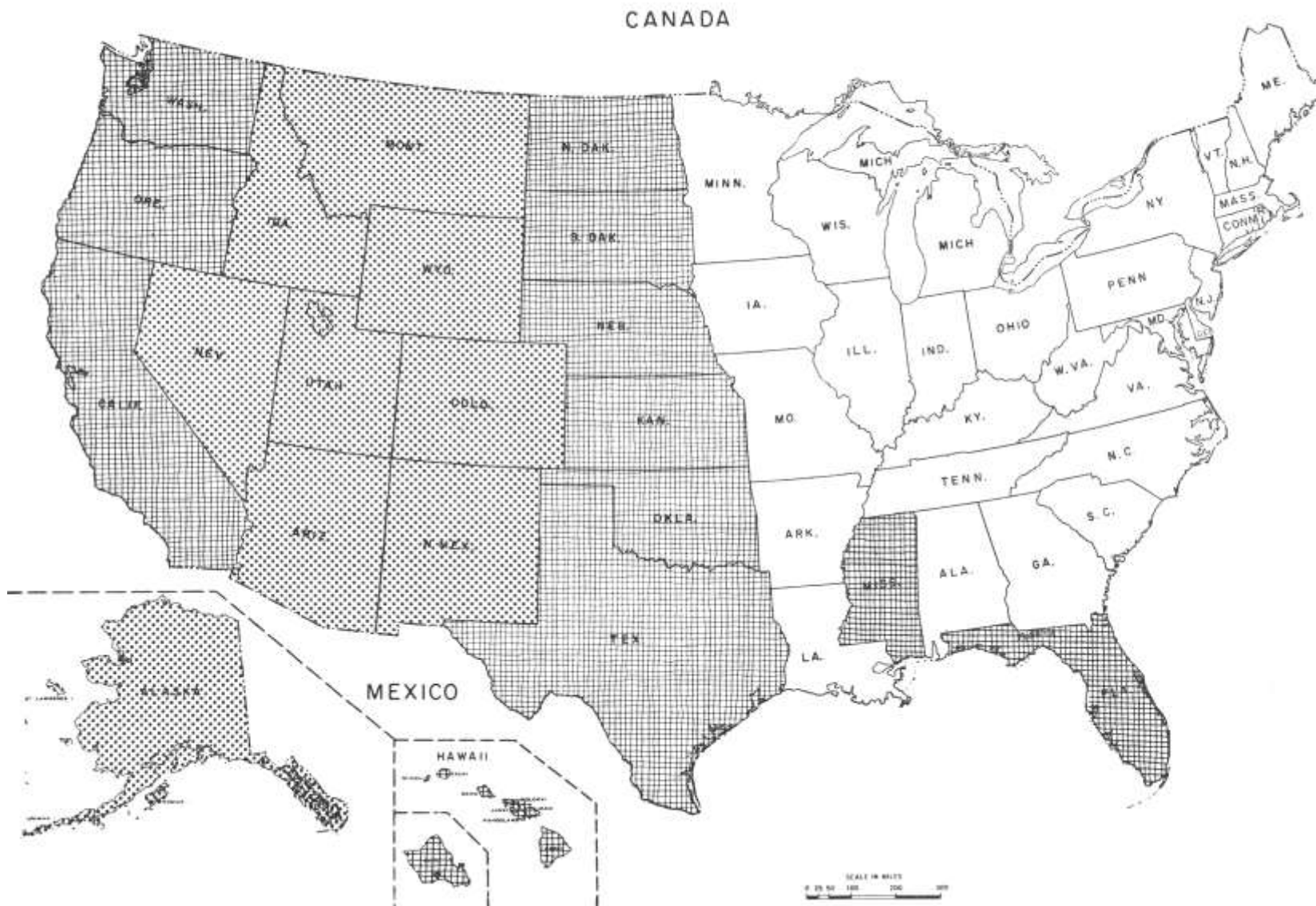
shortage of rainfall which usually results in a shortage of surface water. The Appropriation Doctrine is a highly practical way of apportioning waters in water short areas, since it is founded on the first in time, first in right, principle. Under the Appropriation Doctrine, a water right consists of an amount of water and a priority date. The owner of an appropriation right is entitled to use a stated amount of water even if such a use means that other would-be users with later priority dates are deprived of water.

An appropriation right is usually dated from the first time water is put to beneficial use. Depending upon the state's law, the priority date is some point between the declaration of intent to use water and the actual use of the water. Most states date the appropriation right from the time the owner begins construction on the diversion works.

MAP 2 - APPROPRIATION STATES RECOGNIZING RIPARIAN DOCTRINE

☐ Appropriation Doctrine Exclusively

▣ Riparian Doctrine Recognized



SURFACE WATER

MAP 3 — STATES RECOGNIZING BOTH DOCTRINES

Twelve states recognize both the Appropriation and the Riparian Doctrines. The Riparian Doctrine is the basic law in Mississippi and Florida. For all practical purposes, Hawaii follows the Riparian Doctrine exclusively. Under long standing custom, some ancient rights are based on use of water from man-made canals, therefore Hawaii has been classified as recognizing the Appropriation Doctrine for the purpose of this atlas.

In Nebraska, Oklahoma, and Oregon, the Riparian Doctrine is of minor significance, although there is some indication that in Nebraska the doctrine may be making a comeback. Rights in these states acquired under the Riparian Doctrine are respected, but it is no longer possible to acquire a riparian right.

In some states, both doctrines have significance. The Western States that recognize both doctrines have similar histories. These states adopted the common law upon entering the un-

ion. The courts in these states, unlike the courts in the mountain states, took the position that water rights were governed by the Riparian Doctrine. But the Riparian Doctrine is not suited to arid regions, therefore, the states with large dry areas were forced to recognize the Appropriation Doctrine.

Californian courts have decided the problem of priority between riparian rights and appropriation rights to water from the same source. In California, a riparian right attaches to a tract of land at the time the land passes to private ownership. A riparian right is equal to the right of every other riparian owner, regardless of the relative dates on which the several riparian tracts passed to private ownership. A riparian right is inferior to an appropriation right acquired on public land before the riparian land passed into private ownership; but is superior to an appropriative right acquired after the riparian right.

MAP 3- STATES RECOGNIZING BOTH DOCTRINES

▣ Riparian Doctrine not Significant ▨ Riparian Doctrine still Significant ▤ Riparian Doctrine Primary



SURFACE WATER

MAP 4 - RIPARIAN - COMMON LAW AND REASONABLE USE

In the humid, eastern states water rights are governed by the Riparian Doctrine. Under the common-law Riparian Doctrine, an owner of land contiguous to or abutting a stream has a right to use the water. The riparian right is attached to the riparian land and is considered part and parcel of the land. The riparian owner has the right to require upstream riparian users to allow the stream to flow by or through his land in its natural state. The riparian owner has the duty to allow the stream to leave his land in its natural state. In other words, in its pure form, the Riparian Doctrine does not permit the consumptive use of water, except for minor amounts to satisfy domestic and stock watering needs. The riparian owner is not supposed to disturb the stream, even though he may use the water (or water motion) while the water is flowing by or through his land. This doctrine is suited to humid areas where irrigation which consumes a large amount of water is not necessary.

As soon as irrigation is necessary in a Riparian Doctrine state, the courts modify the strict Riparian Doctrine to allow the owner to

irrigate his riparian land as long as such irrigation is reasonable in relation to other riparian owners on the same stream. Riparian land is land contiguous to or abutting on a watercourse. Usually only lands within the watershed of the stream can be irrigated under the reasonable use doctrine. The reasonable use doctrine gives a correlative right - a share the wealth system - which is explained by the California Supreme Court as follows:

"the length of the stream, the volume of water in it, ...all of these, and many other considerations must enter into the solution of the problem; but one principle is surely established, namely, that no proprietor can absorb all the water of the stream so as to allow none to flow down to his neighbor." *Harris v. Harrison*, 93 Calif. 676, 29 Pac. 325 (Sup. Ct. 1892).

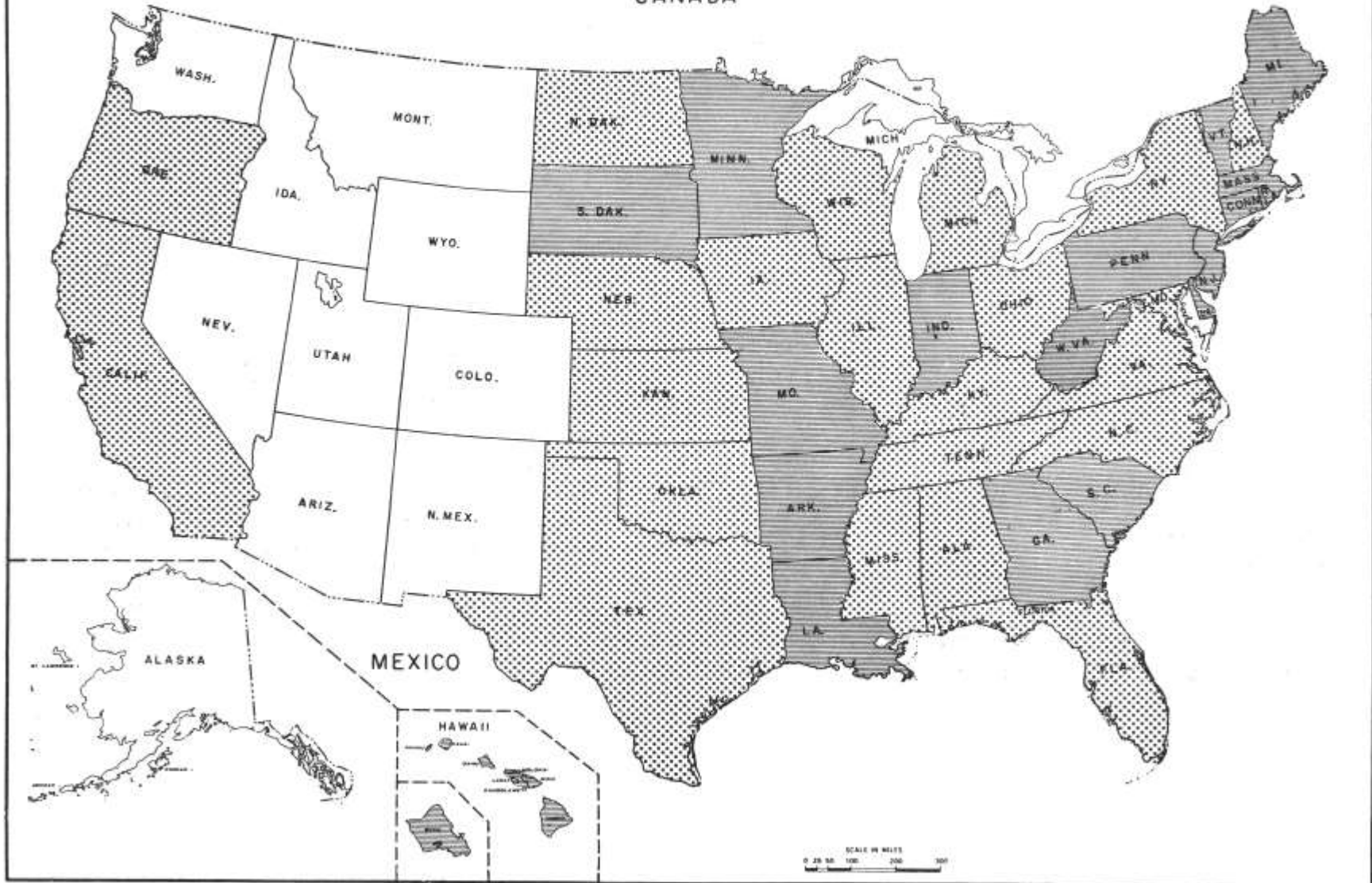
Contrast this with the appropriator's right to consume all the water he needs regardless of the effect on later appropriators.

MAP 4 - RIPARIAN COMMON LAW AND REASONABLE USE

Common Law Riparian Doctrine

Reasonable Use Riparian Doctrine

CANADA



SURFACE WATER

MAP 5 — SUMMARY

Map 5 summarizes the water law in the United States, in-so-far as private rights to surface water are concerned.

In the eight inland mountain states, the Appropriation Doctrine is the only one recognized. Under the Appropriation Doctrine, an individual's right to water is based on beneficial use. The first to use the water is the first in the eyes of the law.

States east of the 98th meridian, except Florida and Mississippi, follow the Riparian Doctrine exclusively. Florida and Mississippi actually follow the Riparian Doctrine in most situations. Under the Riparian Doctrine, a private party's right to water is based on land ownership. Whether or not the water is used is not important. Under the Appropriation Doctrine a water right is acquired through use, and

the right can be forfeited through non-use. But under the Riparian Doctrine use does not create the right and non-use does not forfeit the right. The only important factor under the Riparian Doctrine is ownership of land contiguous to or abutting the watercourse.

The three Pacific coast states and the high plains tier of states recognize both the Appropriation and the Riparian Doctrines. Unlike the mountain states, these states recognized, or rather interpreted the common law to mean that the Riparian Doctrine governed water rights. In most of these states the Riparian Doctrine has proven to be unsuited to the requirements of the area. In general, the Appropriation Doctrine seems to be taking over, either through legislation or through court decision.

GROUND WATER

MAP 6 - DOCTRINES

As with surface water, two basic doctrines or legal theories apply to the ownership and use of ground water. The first of these two doctrines is that of riparian right, also referred to as the common law doctrine of ownership. The other doctrine is that of prior appropriation. Map 6 shows the breakdown by state in the application of these two doctrines.

When considering legal rights and regulations relating to ground water or "underground water" as it is commonly referred to, a distinction is first made between waters of "underground streams" and those waters classified as "percolating." Although the waters constituting an underground stream may vary slightly from state to state, either by statutory definition or court interpretation, it usually includes all those waters in a defined channel underlying a flowing stream directly related and contributing to the surface flow. Because of this direct relationship to surface water, it is understandable that the legal principles and regulations governing underground streams are

usually the same as those applicable to surface streams within a particular state.

Percolating waters, by definition, are those waters which pass through the ground under the surface of the earth without any definite channel and are not part of any surface or underground stream. Although artesian waters come within this definition, some of the states have separate principles and laws governing its ownership and use. Because of the difficulty involved in establishing that certain underground waters meet the requirements for an underground stream, it is usually presumed that all underground water is percolating, thus placing the burden of proving the existence of an underground stream on the one so claiming.

The following discussion of ground water will be limited to percolating waters as herein defined. Ground water constituting underground streams is considered to have already been treated in the foregoing discussion on surface water.

GROUND WATER

MAP 7 — RIPARIAN DOCTRINE — ABSOLUTE OWNERSHIP

The riparian right doctrine as it applies to ground water allows the owner of the land to withdraw from his wells all of the water he wishes on his property for whatever purpose he desires. This doctrine originated with English common-law, and provides for absolute ownership by the owner of the land of those waters underlying the surface of his property. In some states where this doctrine of ownership is applied to ground water, such waters are treated quite like certain minerals located beneath the earth's surface, even to the extent of being "mined."

Map 7 shows those states applying the absolute ownership theory of the riparian right doctrine to ground water. This map shows that this doctrine is an "Eastern doctrine" established early along with other common-law doctrines. Water and land were both plentiful and there was no need to restrict the ownership or use of such waters. As ground water became more burdened by usage, some states saw the need to limit the absolute ownership principle. Reasonable use provided such a limitation.

GROUND WATER

MAP 8 — RIPARIAN DOCTRINE — REASONABLE USE

The English common-law doctrine of absolute ownership of ground water was limited or modified in some states by the application of the American rule of "reasonable use." Reasonable use restricts the landowner in his withdrawal of ground water to the extent that he must exercise his own rights reasonably in view of the similar rights of others. Map 8 shows the states which apply this doctrine.

A further modification of the riparian right doctrine is found in California where the doc

trine of "correlative rights" is also applied. Under this doctrine, the landowner's use of ground water not only must be reasonable in consideration of the similar rights of others, but it must be correlated with the uses of others in times of shortage. Use is restricted to the lands overlying the common supply at times when the supply is limited. When the supply is plentiful, the water may be used on lands either overlying the common supply, or elsewhere.

GROUND WATER

MAP 9 - APPROPRIATION DOCTRINE

The states generally following the doctrine of prior appropriation as to ground water are as shown on Map 9. As can be seen from this map, the prior appropriation doctrine is a western states doctrine. Being a "short water" doctrine, it is understandable that it is applied in the arid states.

The name of the doctrine "prior appropriation" is self-explanatory. The person first applying or appropriating water is first in right. This, of course, becomes very important when there is not enough water to satisfy all appropriators from a particular source, and those with the later priorities must do without. In order for a person to acquire this prior right,

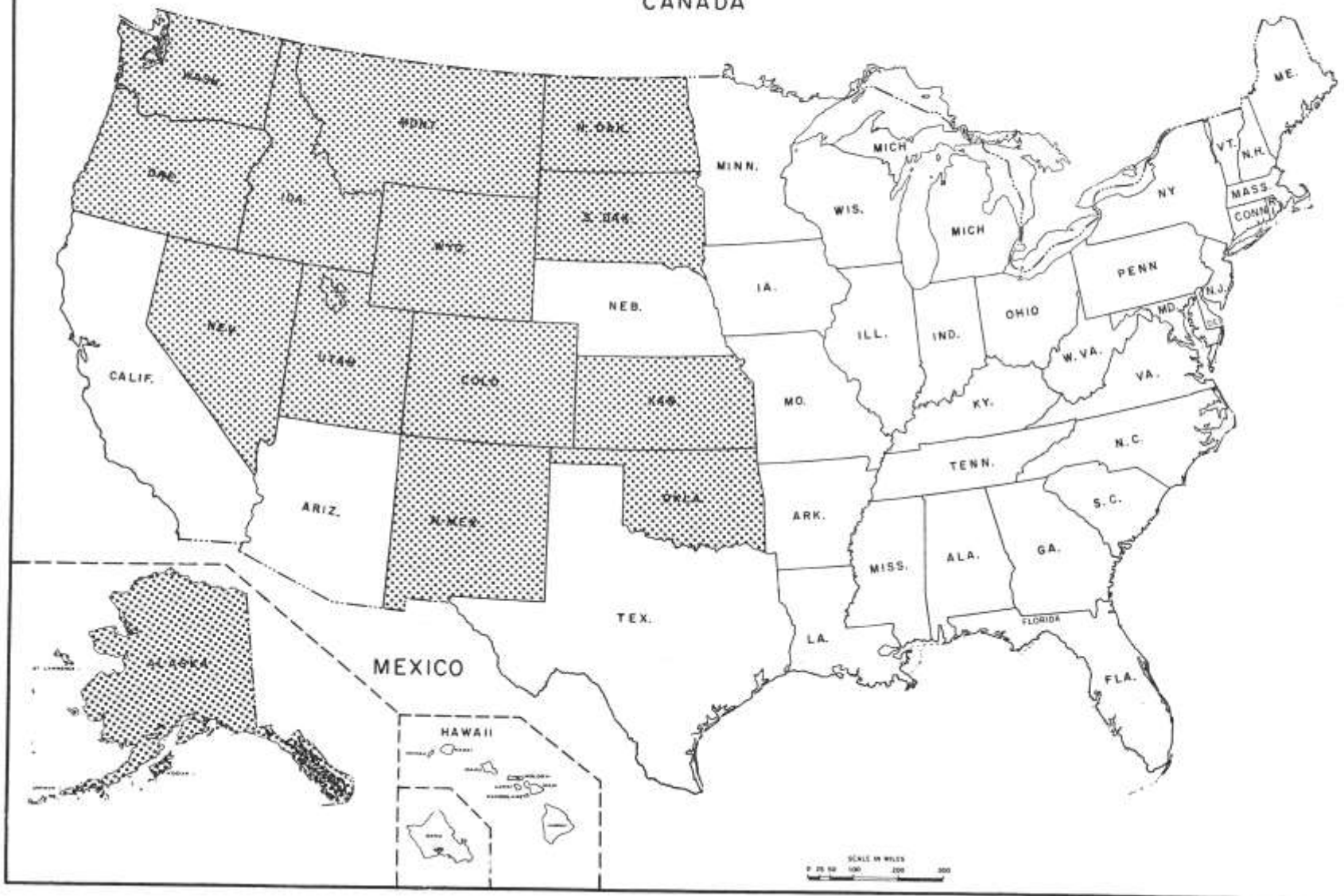
the water must be put to "beneficial use." The uses which are considered beneficial are similar in almost all of the prior appropriation states and can be found listed in the states' ground-water codes.

Although this doctrine appears to be the answer for use of surface water in water-short areas, it is applied with no little difficulty when it comes to ground water. Diverting or appropriating the water by drilling many wells into an underground water supply does not lend itself to a direct showing of relative shortages as can be done with surface water where diversions and shortages are visibly discernible.

MAP 9 - APPROPRIATION STATES

 Appropriation Doctrine Exclusively

CANADA



GROUND WATER

MAP 10 — SUMMARY

The doctrine of prior appropriation regulates the use of ground water in fourteen of the fifty states. The other thirty-six states follow the riparian right doctrine, with twelve of these modifying the doctrine by applying the principle of reasonable use - California adds the principle of correlative rights. The states applying the prior appropriation doctrine are generally the arid western states. The eastern states apply the common law doctrine of riparian rights which recognizes greater property rights in the landowner, and tends to ignore the "public use" idea which is basic to the prior appropriation doctrine.

State regulation of water use is greater in the western states because of the shortage of available water. State regulation of under

ground water use is becoming more common in the eastern states and in some way can be related to the serious pollution problems facing surface water users and the ever-increasing need to utilize ground water to replace or supplement use of surface water. As the usable water supply becomes more critical in these eastern states, it is quite likely that legislation will be enacted imposing regulations similar to those now in effect in the western prior appropriation states. With very few exceptions, the eastern states have been collecting the necessary geologic information and making preliminary studies and surveys on which to base and justify the enactment of comprehensive underground water codes.

MAP 10 - GROUND-WATER SUMMARY

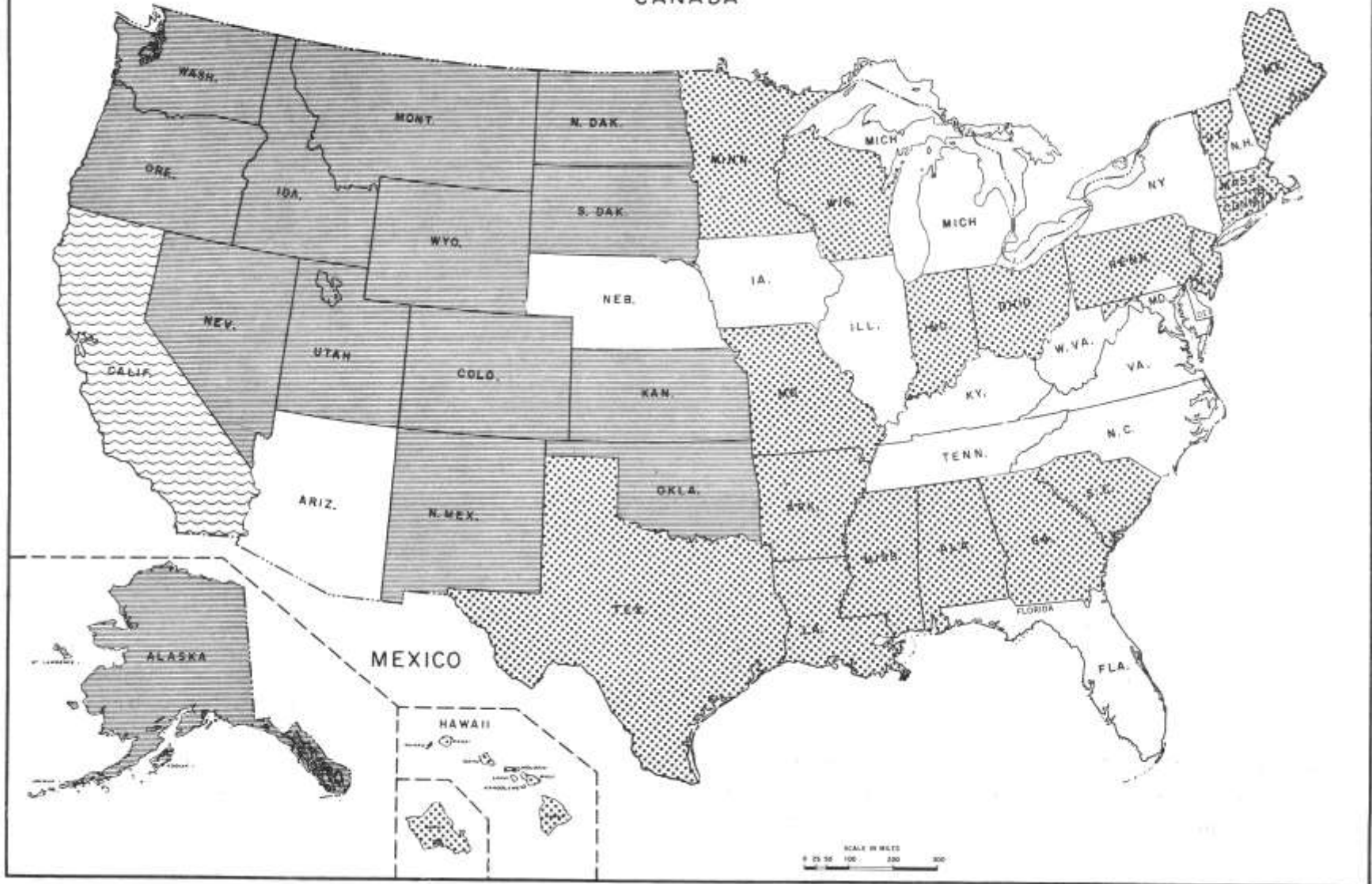
▨ Appropriation

▤ Common Law Riparian

□ Reasonable Use

▧ Correlative Rights

CANADA



GENERAL INFORMATION

MAP 11 — FEDERAL LANDS

States in which over 25% of the land is owned by the federal government include the eight mountain states, the three Pacific states and Alaska. The Appropriation Doctrine is either followed exclusively or is of major significance in all of these states.

United States ownership of large areas of land, and its control of even more land held in trust such as Indian lands, lead to a conflict between the states and the federal government. Many aspects of the conflict are still in dispute.

However, recent court decisions indicate the United States does have the right to reserve all water necessary for the beneficial use of any land withdrawn from the public domain for a specific purpose. In other words, property owned outright or in trust by the United States has a water right which is based on land ownership contiguous to water, (a feature of the Riparian Doctrine) and which is measured by need (a new concept in water law).

It is obvious that the introduction of land ownership as a basis for the United States' water rights into these states which rely primarily, if not entirely, upon the Appropriation

Doctrine would lead to friction between the individual state governments and the federal government. The Appropriation Doctrine is based on use, on the first in time, first in right principle. As between private parties, the Appropriation Doctrine is equitable. But in the case of public land which has been held back for future use by the public, it would not be fair to deprive these lands of necessary water simply because individuals have appropriated all the available water. The Appropriation Doctrine is obviously inequitable in the case of Indian lands. Early non-Indian settlers, because of a tremendous technological advantage, and with a complete disregard for the Indian minority, acquired all the available water. There is little doubt that Indian water rights should be based on need.

Federal legislation has made it possible to join the United States in certain water adjudication suits. Whether the legislation is broad enough to allow the states to administer water rights on federal lands is doubtful, particularly in view of the more recent court decisions.

GENERAL INFORMATION

MAP 12 — AVERAGE ANNUAL RAINFALL

The average rainfall is lowest in the western states. The major water problem in the west is a shortage of water, which of course is a function of the rainfall.

All the mountain states, except Idaho, have less than 20 inches of rainfall a year in areas level enough for agriculture. The few areas where more than 20 inches of rain falls in a year are located high in the mountains where precipitation is in the form of snow. Because a large part of the water supply in the mountain states does come from snow, the seasonal variation in stream runoff is greatest in these states. Because the stream runoffs are concentrated in the spring when the snowpack

melts, the distribution of the available water is not suited to the needs of the area. Over 75% of the annual runoff in many western streams often occurs within a few weeks during the spring. Floods can and do occur during the spring, and yet later in the year farmers in the area need water for irrigation.

One solution to the seasonal variation in runoff is the construction of reservoirs to store water and control flooding. Release of the stored water can be made when it is needed for irrigation. Reservoirs have the added advantage of being popular recreational areas. In fact, recreation often becomes as important a use of water as irrigation.

GENERAL INFORMATION

MAP 13 — ELEVATION

This map clearly demonstrates that the western part of the United States is high above sea level, whereas most of the eastern part of the country is near sea level.

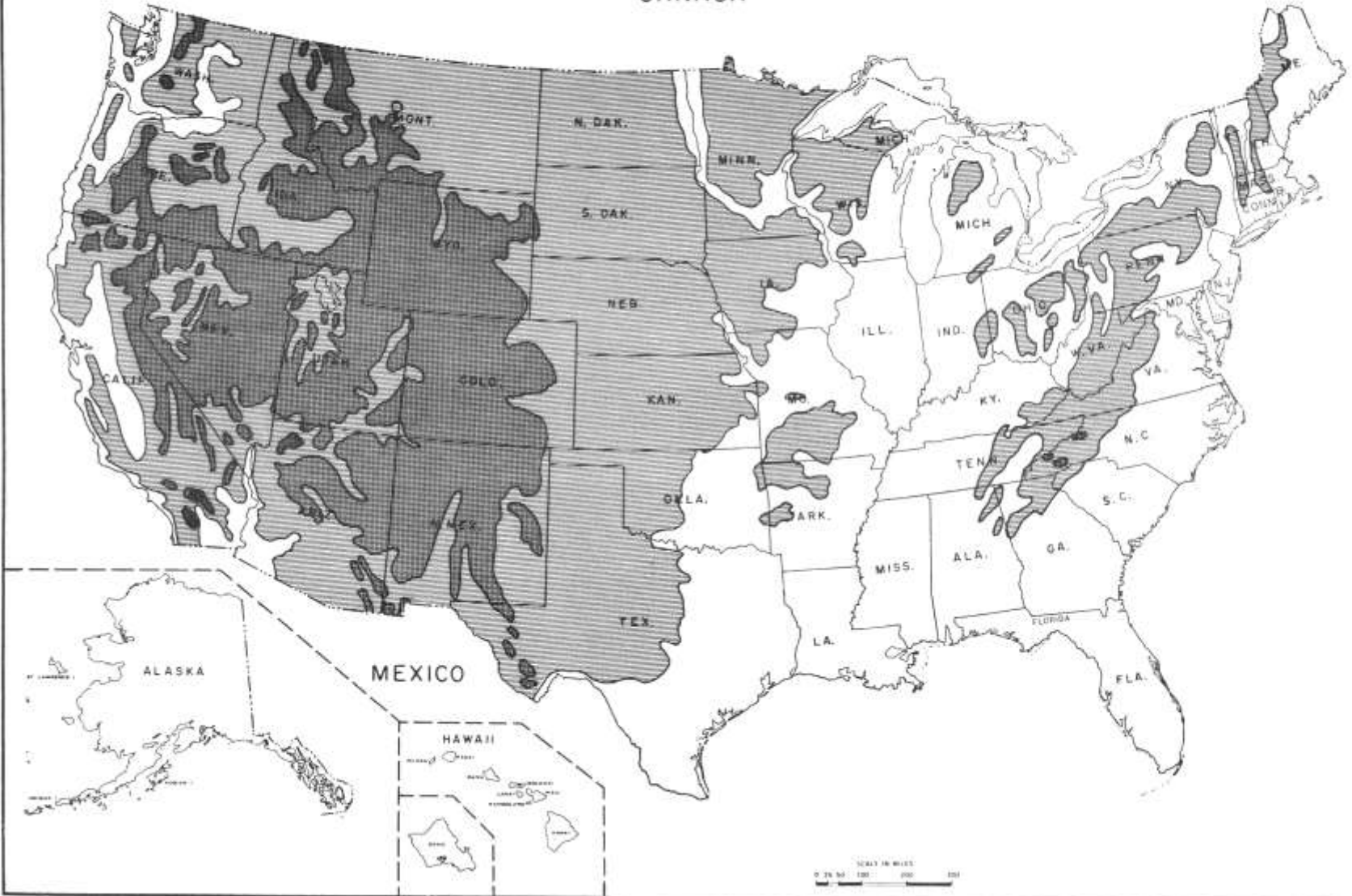
Much has been written about the possibility of importing water from the water surplus parts of the country to the dry mountain states. Map 13 shows why the Pacific northwest is a more suitable source of surplus water than the lower Mississippi Valley area. Both the Pacific northwest and the lower Mississippi Valley have a surplus of water. But much of the Pa-

cific northwest is more than 1000 feet above sea level. The lower Mississippi Valley is for the most part very near sea level. This means that water from the Pacific northwest would have to be lifted 1000 feet less than water imported from the lower Mississippi Valley. Energy may someday become cheap enough to make the difference in elevation unimportant. But it would seem at present that the Pacific northwest offers the most economical source of water for the mountain states.

MAP 13 - ELEVATION

More than 5,000 feet above sea level 1,000 to 5,000 feet above sea level Less than 1,000 feet above sea level

CANADA



GENERAL INFORMATION

MAP 14 — POPULATION DENSITY

With the exception of California and Washington, the population density in all the western states is less than 40 persons per square mile. In the eight mountain states and the northern plains states of Nebraska, South Dakota, and North Dakota, the population density is less than 20 persons per square mile.

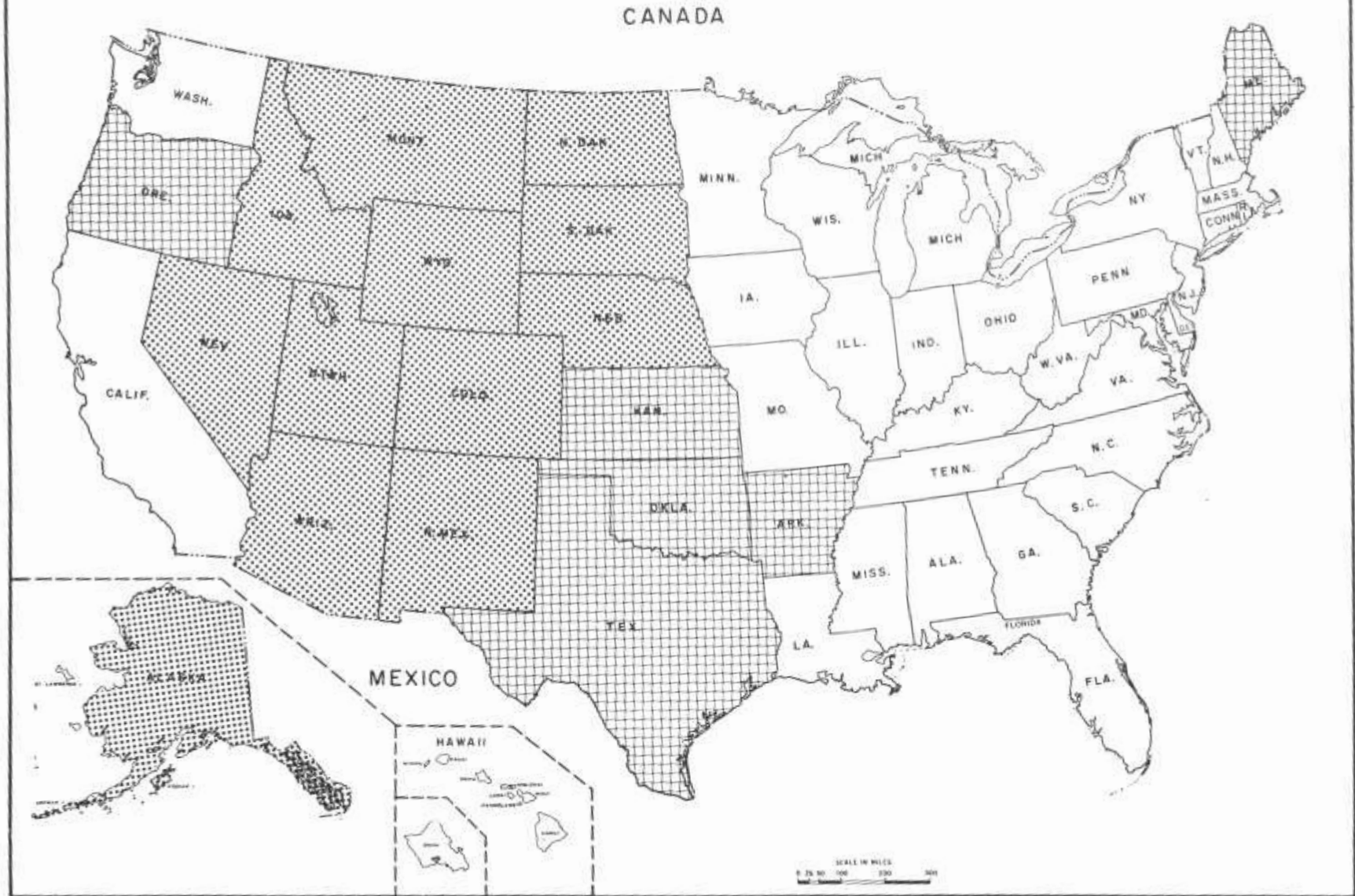
In view of the population explosion it is important to realize that the area of the country

still greatly under-populated is the west where water is scarce, where the land is high above sea level, and where a large part of the land is owned by the United States. It is obvious that if water is made available, more and more people will migrate to the west, since there seems to be a definite relationship between the availability of water and the population.

MAP 14 - POPULATION DENSITY (1960)

Less than 20 persons per sq. mi.

Less than 40 persons per sq. mi.



GENERAL INFORMATION

MAP 15 — IRRIGATED LANDS

As would be expected, irrigation is practiced primarily in the west. Florida, and to a lesser extent Arkansas and Louisiana, practice irrigation because the rainfall is seasonal but the climate is such that crops can grow all year.

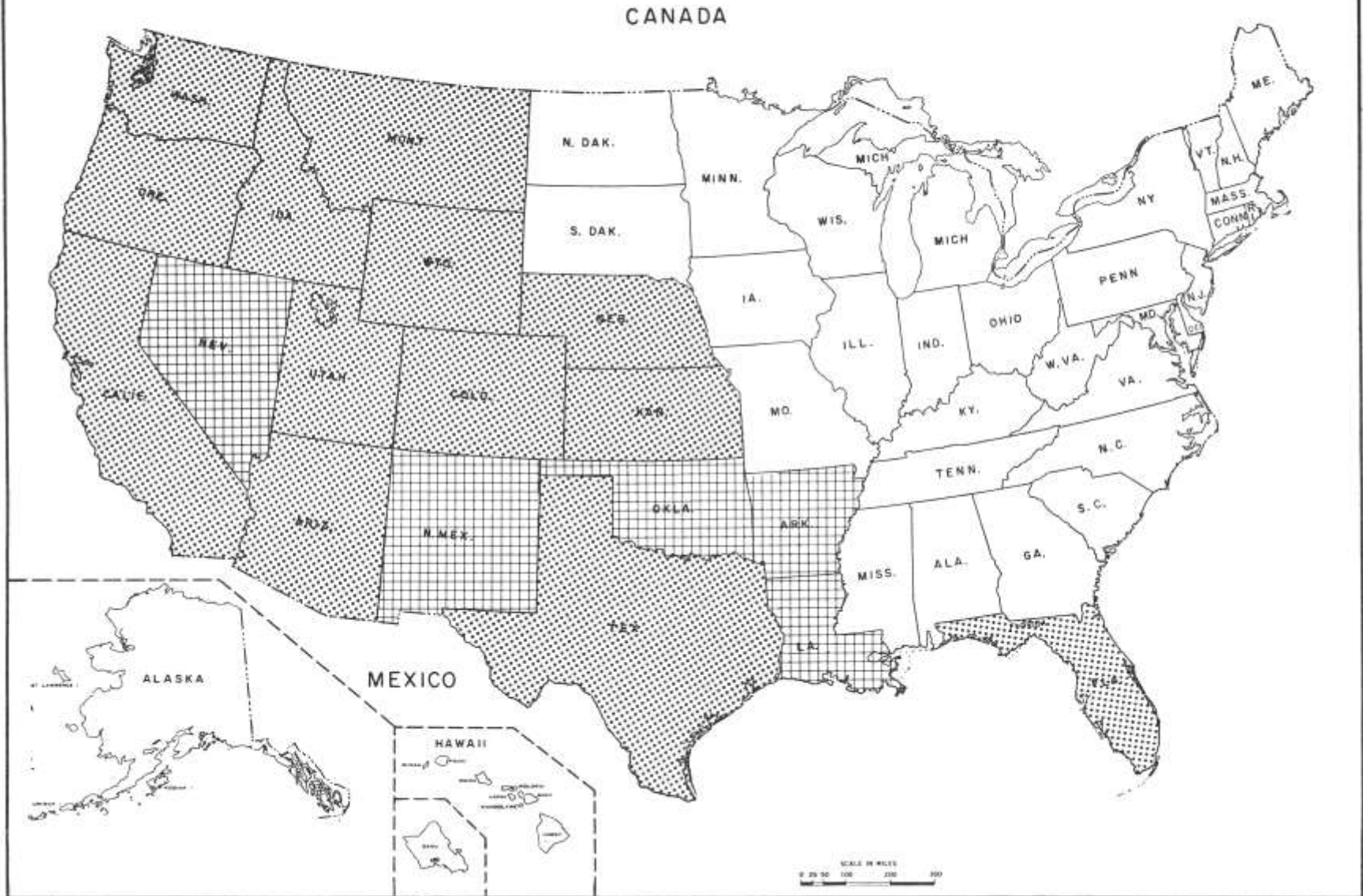
The beginning of man's effort to irrigate soil that is dry and lifeless is, like the beginning of civilization itself, lost in the mists of prehistory. But historians agree that civilization is closely tied to water problems. It has been suggested that historic times began when agriculture changed because of the introduction of irrigation.

The advent of irrigation, which had a casual relationship with civilization, made rules governing water use an absolute necessity. The Code of Hammurabi, King of Babylonia from 2285 B. C. to 2242 B. C., had detailed provisions relating to irrigation. The Code of Hammurabi is the oldest code of laws known to man, being some 4000 years old. But it is quite probable that the provisions in the Code of Hammurabi were settled long before his empire was formed. Since the dawn of civilization, man has been irrigating and passing laws controlling the use of water.

MAP 15 - IRRIGATED LANDS

Over 1,000,000 acres

Over 300,000 acres



GENERAL INFORMATION

MAP 16 — VALUE OF FARM PRODUCTS

With the exception of California and Texas, the value of farm products in the eastern states far exceeds the value of such products in the west. Put another way, the value of farm products in non-irrigated areas far exceeds the value of products produced on irrigated farms.

Irrigation is probably the single largest consumptive use of water. Yet, irrigation is largely confined to the west where water is in extremely short supply. Map 16 shows that

the return from irrigated land does not appear to be nearly as great as the return from farming in wet areas of the country. It has been suggested that in view of the low dollar return and the high consumption of water, irrigation is not as economical a use of water in the west as many other possible uses. It does seem that either more water at a relatively cheap cost must be made available in the west or western agriculture will suffer.

GENERAL INFORMATION

MAP 17 — SURFACE WATER LEGISLATION

Map 17 refers only to legislation directed to the ownership of water rights. Nebraska and all of the mountain states, except Nevada, have constitutional provisions protecting water rights. All of the states with constitutional provisions, except Montana, have statutory provisions governing the use of water. The rest of the western states, except North Dakota, and an ever-increasing number of states in the east have statutory provisions controlling water use.

Water is essential to life, and where water is in short supply, conflicts over water are inevitable. Society relies on the law to settle such conflicts. Laws concerning water rights deal largely with the question of who may use waters of a stream or underground water source, and the limitations imposed on such use.

This atlas shows that water rights are governed by the riparian or the appropriation doctrines. The regulation of water rights in states following either doctrine can lead to what can be considered another system of water law. Where regulation becomes detailed, and where procedural rules begin to affect the substantive rights of water users, the state may be considered to be following the Administrative System of Water Law. The Administrative System, or quasi-system, of water law is a function of water legislation. As Map 17 indicates, the western states have the most legislation and the states which can be considered to be following the Administrative System of Water Law are in the west.

MAP 17 - SURFACE WATER LEGISLATION
DEGREE OF STATE CONTROL

 Constitutional Provision

 Statutory Provision



MAP 18 — GROUND-WATER LEGISLATION

Map 18 shows those states which have statutory regulation of the taking and using of ground water. It should again be pointed out that this breakdown does not include those states which regulate underground streams with surface water, but have no regulation of percolating waters as such. Also, it does not include those states which merely require a well driller to have a permit. Also excluded are states like Texas where regulation can be imposed through the formation of an underground water district but no direct statutory regulation by a state agency. The five states ripple-marked on Map 18 are those having a Constitutional provision relating to ground water. The Constitutions of California, Montana, and Washington declare all water to be a public use and subject to state regulation, with no specific mention made of either surface or ground water. The Alaska Constitution specifically reserves both surface and subsurface waters to common use. By its Constitution, Utah recognizes all existing rights to the use of water for beneficial purposes. It is interesting to note that California is the only riparian state


having a Constitutional provision which includes ground water, but has no further statutory regulation (within the breakdown stated above) governing the use of ground water.

The statutory provisions regulating the taking and use of ground water may be made applicable to "all" ground waters within the state, such as in Utah, or to ground waters as defined by the Washington statute to be "All bodies of water that exist beneath the land surface and that there saturate the interstices of rocks or other materials - that is, the waters of underground streams or channels, artesian basins, underground reservoirs, lakes or basins, whose existence or whose boundaries may be reasonably established or ascertained - are defined for the purpose of this chapter as "ground waters" ..." . Revised Code of Washington, Anno., 90.44.035.

New Mexico applies its ground-water regulations only to waters within those areas declared to be underground basins. Arizona applies its regulations only after an area is declared to be a "critical ground-water area."

MAP 18 - GROUND-WATER LEGISLATION

 Constitutional Provision

 Statutory Provision



MAP 19 — GROUND-WATER PERMITS

The extent of control over ground water exercised by a state is usually proportionate to the availability of water. Where ground water is not particularly short, the state may merely require a well drilling permit for the purpose of obtaining geologic information. Where ground water is in shorter supply, the drilling permit becomes more than a formality and more in the nature of an application for groundwater use. Those states requiring an application of this nature are shown on Map 19. Where ground-water shortage is recognized as a prob

lem, it will be reflected in the laws controlling its usage. Such controls as the formation of ground-water districts, declaration of closed basins, etc., will be in evidence. Another indication as to the seriousness of ground-water shortage will be the level at which its use is being controlled. Close control by a state agency as against control by a regional or local organization usually indicates a more critical ground-water situation. Pollution is also cause for greater controls.

MAP 20 — PRIORITIES AND PREFERENCES

Those states where priorities or preferences in use of ground water are recognized are shown on Map 20. Of the sixteen states recognizing priorities or preferences, all but two follow the appropriation doctrine. A basic principle of this doctrine is that "first in time is first in right." Where a shortage of water exists and rights of equal priority time-wise cannot be satisfied, certain uses are usually given a preference. A good example of the order of preference can be found in the Kansas laws which provide as follows: "Where uses of water for different purposes conflict such uses shall conform to the following order of preference: Domestic, municipal, irrigation, industrial, recreational and water power uses. However, the date of priority of an appropriation right, and not the purpose of use, determines the right to divert and use water at any time when the supply is not sufficient to satisfy all water rights that attach to it. The holder of a water right for an inferior beneficial use of water shall not be deprived of his use of the water either temporarily or permanently as long as he is making proper use of it under the terms and conditions of his water rights and the laws of this state, other than through condemnation." Kansas Statutes Anno., Sec. 82a-707(b).

Of the two states applying the riparian right doctrine (Hawaii and Nebraska), together with the preference in use feature, Nebraska has the order of preferences listed as domestic, agricultural, manufacturing, and industrial.

A good concise statement and categorization on preference in use is found in Clark, Waters and Water Rights, Vol. I, Sec. 54. 3(A) at page 369: "Modern law separates preferences into three general classes: First is a right or high priority that may be exercised irrespective of all other rights and in the exercise of which no compensation is paid. This is sometimes called a true preference. Secondly, there are preferred uses defined by statute that are enforced by condemnation; in these cases, compensation must be paid for taking another's property right. A third type of preference is found in the administrative discretion granted to public officials to choose among different uses in granting applications for permits to use water. A hierarchy of preferences is often established by statute and the official must decide between superior and inferior beneficial uses in granting or denying the application. These statutes are not uniform in ordering all of the preferences, but all of them prefer domestic uses over other uses."

GENERAL INFORMATION

MAP 21 — WEATHER MODIFICATION

This atlas has covered the standard approaches to water problems. Map 21 shows that twenty-three states have already passed legislation dealing with weather modification which is a new technique more in keeping with the atomic age.

The weather modification statutes regulate the persons engaged in "rain-making" and provide for the administration of such activity.

"Rain-making" or more properly, climate

modification, is just one of the newer approaches to the Nation's water problems. Serious research is progressing towards making saline water into fresh water on an economical basis. The use of atomic energy may make the possibility of transporting large amounts of water from wet areas to dry areas a reality. Science and technology are working towards solving man's continuing water problems.

SELECTED BIBLIOGRAPHY

It would be impractical to list all of the many reference works, not to mention the hundreds of case reports, used to compile the information for this atlas. However, the authors list the following references which were of particular value:

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