

96. Idaho Stat. § 42-237a(g) (Supp. 1979); Or. Rev. Stat. § 537.525(9), - .620 (3) (1977). See also Mont. Code Ann. § 85-2-507(2)(b)(ii) (1979).
97. E.g., Alaska Stat. tit. 46, ch. 15 (1977) (no distinction made in state water code between ground water and surface water); Colo. Rev. Stat. §§ 37-92-102, -401, -501 (1973); Wyo. Stat. Ann. § 41-3-916 (1977). See generally 5 Waters and Water Rights § 441 n.30 (R. Clark ed. 1972). The National Water Commission concluded that in many states the laws need to be revised to better take account of the frequent physical interrelationship of surface and ground water. National Water Commission, Water Policies for the Future 233 (1973).
98. E.g., Alaska Stat. § 46.03.010(a)(1977) ("overall economic and social well-being" of the people of the state); Mont. Code Ann. § 85-1-101(2) (1979) ("maximum economic and social prosperity for [Montana] . . . citizens"). The same distinction is used in C. Corker, supra note 2, at xxii and 127-42 and, to a lesser extent, in National Water Commission, Water Policies for the Future 271, n. 81 (1973).
99. See F. Trelease, Federal-State Relations in Water Law, National Water Commission Legal Study No. 5, at 21-29 (1971). See also 1 Waters and

- Water Rights § 18.1 (R. Clark ed. 1967); 1 W. Hutchins, Water Rights Laws in the Nineteen Western States 159-65 (1971).
100. See J. Gould, Waters 281 (1883); J. Long, Irrigation § 43 (2d ed. 1916).
101. See note 16 supra.
102. Major water law treatises published in 1911 and 1912 reported that the appropriation doctrine was inapplicable to percolating ground water. 2 S. Wiel, Water Rights in the Western States § 1106(3d ed. 1911); 2 C. Kinney, Law of Irrigation and Water Rights § 1190 (1921).
103. These doctrines have been explained and analyzed at length by a number of writers, e.g. 6A American Law of Property §§ 28.65-28.68 (A. Casner ed. 1954); 5 R. Powell, Real Property ¶ 725-27 (1968); Hanks & Hanks, The Law of Water in New Jersey: Groundwater, 24 Rutgers L. Rev. 621 (1970).
104. See National Water Commission, Water Policies for the Future 231 (1973). A number of detailed accounts of the extension of the appropriation doctrine to percolating ground water are available, e.g., Clark, Groundwater Legislation in the Light of Experience in the Western States,

- 22 Mont. L. Rev. 42 (1960); Dunbar, The Adaptation of Groundwater - Control Institutions to the Arid West, 51 Agricultural History 662 (1977); Hutchins, Ground Water Legislation, 30 Rocky Mt. L. Rev. 416 (1958); Hutchins, Legal Ground Water Problems in the West, 22 National Reclamation Association Proceedings 81 (1953).
105. But cf. National Water Commission, Water Policies for the Future 231-32 (1973) (suggesting this theory usually does not work out in practice). For a court order putting the theory into practice, see Baker v. Ore-Ida Foods, Inc., 95 Idaho 575, 513 P.2d 627 (1973).
106. E.g. Schodde v. Twin Falls Land & Water Co., 224 U.S. 107 (1912); Tulare Irrigation Dist. v. Lindsay-Strathmore Irrigation Dist., 3 Cal.2d 489, 45 P.2d 972 (1925); State ex rel Crowley v. District Court, 108 Mont. 89, 88 P.2d 23 (1939).
107. C. Corker, supra note 2, at ix. For discussion of other differences between groundwater and surface water management, see id. at 148-49 and 152.
108. The reasonable pumping level concept is, of course, not the only tool for coping with overdevelopment. Another important, but not unrelated tool, in legislative policy on ground water mining. See discussion pp. 7-9 supra.

109. Moyer v. Preston, 6 Wyo. 308, 318-19, 44 P.845, 847 (1896) (emphasis added).
110. C. Meyers, A Historical and Functional Analysis of the Appropriation System, National Water Commission Legal Study No. 1, at 6 (1971).
111. 5 R. Powell, Real Property ¶ 725 (1968) reports that twenty-eight states had accepted the rule at some point prior to 1922.
112. The water may not be extracted for a malicious purpose or allowed to go to waste, though. F. Maloney, S. Plager & F. Baldwin, Water Administration: The Florida Experience §54.2(a) (1968). Texas, an absolute ownership state, recently held that a well owner is liable to neighbors for land subsidence caused by negligence in extracting ground water. Friendswood Deveopment Co. v. Smith-Southwest Industries, 576 S.W.2d 21 (Tex. 1978) (decision given prospective effect only).
113. See W. Hutchins, Selected Problems in the Law of Water Rights in the West 158 (1942). Other factors were disenchantment with the absolute ownership tenets that: (1) the movement of percolating water was so occult and concealed that no workable regulatory system could be devised, (2) a person should have the same ownership rights in water under his land as in soil

- and rocks, and (3) limiting ground water withdrawals would interfere with drainage necessary for mining, road construction, agriculture, etc. See e.g., Meeker v. City of East Orange, 77 N.J.L. 623, 74 A. 379 (1909).
114. E.g., Meeker v. City of East Orange, 77 N.J.L. 623, 637 A. 379 (1909).
115. See 2 S. Wiel, Water Rights in The Western States § 1041 (3d ed. 1911); Huffcut, Percolating Waters: The Rule of Reasonable User, 13 Yale L. J. 222 (1904).
116. 1 Waters and Water Rights § 17.2 (R. Clark ed 1967); R. Powell, Real Property ¶ 726 (1968).
117. E.g., National Resource Planning Board, Report of Subcommittee on State Water Law, State Water Law in the Development of the West 79 (1943).
118. Noh v. Stoner, 53 Idaho 651, 26 P.2d 1112 (1933).
119. This result was not compelled by precedent because not all that many means of diversion cases had been decided under the appropriation doctrine, most of those had involved surface diversions, and the results were inconclusive ---with some cases protecting a senior's means of diversion only if it was reasonable and others giving protection without seeming concern for the reasonableness of the means. See W. Hutchins, Selected Problems in the Law of

- Water Rights in the West 168-79 (1942); Annot.,
121 A.L.R. 1044 (1939).
120. Thompson and Fiedler, Some Problems Relating to
Legal Control of Ground Waters, 30 J. of Ameri-
can Water Works Ass'n. 1049, 1075 (1938). See
also W. Hutchins, Selected Problems in the Law
of Water Rights in the West 179 (1942).
121. Parry, An Underground Water Code, 23 Idaho State
Bar Proceedings 19 (1949).
122. Ch. 200, 1951 Idaho Sess. Laws.
123. Ch. 182, §1 1953 Idaho Sess. Laws. This statute
is currently in force as Idaho Code § 42-226
(Supp. 1980).
124. In an article that spawned much legal-economic
literature, economist R. H. Coase argued that
legal rules will not affect the efficient alloca-
tion of resources if certain conditions are met,
such as zero cost in collecting property right
transfer data and the accomplishing of trans-
fers. Coase, The Problem of Social Cost, 3
J. Law & Econ. 1 (1960). Coase's analysis does
not undermine the approach of the Idaho statute
because not all the conditions necessary for
operation of the Coase theorem are satisfied in
the ground water context.
125. M. Horwitz, The Transformation of American Law,
1780-1860 33-34 (1977).

126. 95 Idaho 575, 584, 513 P.2d 627, 636 (1973).
127. Trelease, Policies for Water Law: Property Rights, Economic Forces, and Public Regulation, 5 Nat. Res. J. 1, 3-4 (1965).
128. See generally C. Corker, supra note 2 at 128.
129. National Water Commission, Water Policies for the Future 380-81 (1973).
130. Trelease, Policies for Water Law: Property Rights Economic Forces, and Public Regulation, 5 Nat. Res. J. 1, 14 (1965).
131. C. Corker, supra note 2, at 128-30, 135-36. The advocacy was not without recognition of the need to consider also factors lying outside the traditional domain of economics. Id. at 137-42.
132. E.g., A. Dasgupta & D. Pearce, Cost-Benefit Analysis (1972); F. Mishan, Cost-Benefit Analysis (2d ed 1976); P. Sassone & W. Schaffer, Cost-Benefit Analysis: A Handbook (1978).
133. See C. Corker, supra note 2, at 128.
134. See pp.4-5 supra.
135. For discussion of streamflow-groundwater interaction in standard hydrologic works, see W. Walton, Groundwater Resource Evaluation 174-88 (1970) and D. Todd, Ground Water Hydrology 151-55 (1959).
136. For further discussion, see W. Walton, Groundwater Resource Evaluation 623-27 (1970).

137. Government Accounting Office, Ground Water: An Overview 15 (Report to Congress by the Comptroller General 1977).
138. For further discussion, see D. Todd, Ground Water Hydrology 177-78 (1959).
139. Government Accounting Office, Ground Water: An Overview 16-17 (Report to Congress by the Comptroller General 1977).
140. For an account of opposition to phreatophyte removal because of its effect on wildlife habitat, see Gilluly, Wildlife Versus Irrigation, 99 Science News 184 (1971)
141. See notes 26-30 supra and accompanying text.
142. See, e.g., C. Corker, supra note 2, at A1-70 ("We are comparatively naive about aquifers because the reward for learning more about groundwater resources has not appeared to warrant the expenditure of large sums of money."); Crosby, A Layman's Guide to Groundwater Hydrology in C. Corker, supra note 2, at 80-81, 95-96; General Accounting Office, Ground Water: An Overview 30-34 (Report to Congress by the Comptroller General 1977); National Water Commission, Water Policies for the Future 245 (1973); W. Walton, Groundwater Resource Evaluation 1 (1970).

143. See notes 109-10 supra and accompanying text.
144. Hardin, The Tragedy of the Commons, 162 Science 1243 (1968).
145. See J. Hirschliefer, J. DeHaven, J. Milliman, Water Supply: Economics, Technology and Policy 59-66 (1960).
146. Governor's Comm'n. to Review California Water Rights Law, Final Report 144 (1978).
147. See notes 111-114 supra and accompanying text.
148. See Kansas and New Mexico statutes in note 32 supra; City of Corpus Christi v. City of Pleasanton, 154 Tex. 289, 276 S.W.2d 798 (1955). Until 1945, however, Kansas had the absolute ownership doctrine. National Water Commission, A Summary Digest of State Water Laws 330 (1973).
149. Bagley, Water Rights Law and Public Policies Relating to Ground Water "Mining" in the Southwestern States, 4 J. Law & Econ. 144, 172 (1961).
150. D. Green, The Land of the Underground River 165, 167, 168 (1973).
151. Bagley, supra note 149, at 173, noted the influence of economic conditions upon ground water development in the High Plains region of Kansas, New Mexico and Texas.
152. Gowen, Economics of Irrigation, Southwestern Crop and Stock 50 (Sept. 1948), quoted in Green, supra note 150, at 183.

153. This premise is made explicit in the Colorado and Idaho statutes cited in note 68 supra.
154. Morse, Well Pumping and a Declining Water Table -An Economic Analysis (unpublished paper prepared for Water Law, Stanford University, June 1, 1967), excerpted in C. Meyers & A. Tarlock, Water Resource Management 686 (2d ed. 1979).
155. This would seem to be true regardless of whether the legal remedy afforded seniors is damages or injunctive relief.
156. See generally, National Water Commission, Water Policies for the Future 42 (1973); P. Sassone & W. Schaffer, Cost-Benefit Analysis: A Handbook 159-60 (1978).
157. See General Accounting Office, Ground Water: An Overview 5-8 (Report to Congress by the Comptroller General 1977).
158. 221 U.S. 485 (1910).
159. 194 Colo. 489, 575 P.2d 372 (1978).
160. See also Mont. Code Ann. § 85-1-214(1)(1979) (state water agency may exercise any of its powers in an adjoining state unless not permitted under the laws of that state or the United States); C. Corker, supra note 2 at 245-47 (discussing interstate agreements between administrative agencies regarding interstate waters).

161. 221 U.S. at 487. 162. C. Corker, Water Rights in Interstate Streams in 2 Waters & Water Rights § 131.3 (R. Clark ed. 1967) concludes that Bean is ambiguous as to whether the Court's assumption about Montana's inclination to do so was an inference of fact, a rebuttable presumption, or a substantive rule of federal law stated as a legal fiction.
163. Fundingsland v. Colorado Ground Water Commission, 171 Colo. 487, ___, 468 P.2d 835, 836 (1970).
164. 575 P.2d at 377.
165. See A. Dasgupta & D. Pearce, Cost-Benefit Analysis: Theory and Practice 54-69 (1972); E. Mishan, Cost-Benefit Analysis 382-402 (rev.ed. 1976); P. Sassone & W. Schaffer, Cost-Benefit Analysis: A Handbook 6-12 (1978).
166. B. Ackerman, Economic Foundations of Property Law xi-xii (1975).
167. See A. Dasgupta & D. Pearce, Cost-Benefit Analysis: Theory and Practice 57 (1972); P. Sassone & W. Schaffer, Cost-Benefit Analysis: A Handbook 8-9 (1978).
168. See A. Dasgupta & D. Pearce, Cost-Benefit Analysis: Theory And Practice 57 (1972); E. Mishan, Cost-Benefit Analysis 390-96 (rev.ed. 1976); P. Sassone & W. Schaffer, Cost-Benefit Analysis: A Handbook 9-11 (1978).

169. B. Ackerman, Economic Foundations of Property Law xiii (1975). See also E. Mishan, Cost-Benefit Analysis 412-13 (rev.ed. 1976).
170. It has been argued that the more progressive the tax structure is and the more intense competition is, the more likely a Pareto improvement under the hypothetical compensation standard will result in an actual Pareto improvement or something close to it. E. Mishan, Cost-Benefit Analysis 393 (rev. ed. 1976). But cf. P. Sassone & W. Schaffer, Cost-Benefit Analysis: A Handbook 11 (1978) (viewing the progressive tax structure argument as less than completely convincing).
171. P. Sassone & W. Schaffer, Cost-Benefit Analysis: A Handbook 23-24 (1978). See also E. Mishan, Cost -Benefit Analysis xviii-xix (rev.ed. 1976).
172. Furrer v. Talent Irrigation Dist., 258 Or. 498, _____, 466 P.2d 605, 613 (1970). Similarly, Colarchik v. Watkins, 144 Mont. 17, _____, 393 P.2d 786, 789 (1964), held that: "a court cannot create a ditch right for one landowner on another's property without first compensating the landowner for the value of the easement The mere fact that less damage would be done [by granting an easement] does not create

- a basis for granting respondent an easement." In *Morris v. Bean*, 146 F. 423, 436 (D. Mont. 1906), aff'd 159 F.651 (9th Cir. 1908) and 221 U.S. 485 (1911), the court stated that allowing numerous upstream junior appropriators to take water to the detriment of downstream seniors may benefit more people with less waste "but equity does not consist in taking the property of a few for the benefit of the many, even though the general average of benefits would be greater."
173. Calabresi and Melamed, Property Rules, Liability Rules, and Inalienability: One View of the Cathedral, 85 Harv. L. Rev. 1089, 1098 (1972).
174. Id. at 1100. The leading text uses the term "merit wants" to refer to goods or services which are "considered so meritorious that their satisfaction is provided through the public budget, over and above what is provided for through the market and paid for by private buyers." R. Musgrave, The Theory of Public Finance 13 (1959).
175. Text accompanying note 125 supra.
176. See Tarlock, Appropriation for Instream Flow Maintenance: A Progress Report on "New" Public Western Water Rights, 1978 Utah L. Rev. 211, 211-12. Also present, perhaps, is an element of the labor theory of property often associated

- with John Locke. See note 83 supra; see generally L. Becker, Property Rights: Philosophic Foundations (1977).
177. R. Brandt, Ethical Theory 415 (1959).
178. Id. at 420.
179. G. Lefcoe, An Introduction to American Land Law: Cases and Materials 6-7 (1974).
180. See generally, P. Gates, History of Public Land Law Development ch. 22 (1968) (written for Public Land Law Review Commission).
181. The standard examples of merit goods, such as free education, low cost public housing and medicare, involve governmental intervention in the market through taxation and monetary subsidies. A water use preference is a less direct subsidy through governmental regulation to produce lower cost domestic water than under market allocation. Standard merit goods are thought to involve benefits to society that transcend the benefits to individual recipients. See J. Due & A. Friedlaender, Government Finance: Economics of the Public Sector 79-80, 191 (1973). Arguably, the same is true of low cost domestic water.
182. See, e.g., 43 U.S.C. § 431 (1976) (160 acre limitation in Reclamation Act of 1902); Wash. Rev. Code Ann. §§ 90.66.010-.910 (Supp. 1980) (Family Farm Water Act).

183. E.g., Corey, Size of Farm in Relation to Irrigation Pumping Costs, 12 Transactions of the American Society of Agricultural Engineers 795 (1969).
184. Cf. Trelease, Federal-State Problems in Packaging Water Rights in Rocky Mountain Mineral Law Foundation, Water Acquisition for Mineral Development, paper 9, p. 11 (1978) ("In much of the rural west water is held almost in reverence. Water rights are heirlooms to be treasured beyond their intrinsic value. There is real resistance to the notion that water is an article of commerce and subject to trading in the market place. The notion persists that water for cattle, for hay, for fodder, for feed grain, for cash crops is the highest and best use of the resource." See also A. Maass & R. Anderson, . . . and the Desert Shall Rejoice: Conflict, Growth and Justice in Arid Environments 5 (1978).
185. Calabresi & Melamed, Property Rules, Liability Rules, and Inalienability: One View of the Cathedral, 85 Harv. L. Rev. 1089, 1093-1105 (1972).
186. Id. at 1105. Their other suggestion for the final category is "reasons which, though distributional, cannot be described in terms of broad principles like equality." Id.

187. For discussion of this rule, see 1 W. Hutchins, Water Rights Laws in the Nineteen Western States 576-77 (1971).
188. Id. at 623-44.
189. Fisher, Western Experience and Eastern Appropriation Proposals, in D. Haber & S. Bergen, The Laws of Water Allocation in the Eastern United States 75, 108-09 (1956).
190. J. Sax, Water Law, Planning and Policy: Cases and Materials 273-74 (1968).
191. J. Brunhes, Étude de géographie humaine: L'irrigation ses conditions géographiques, ses modes, et son organisation dans la péninsule ibérique et dans l'Afrique du Nord 429-39 (1902). I wish to thank Mary Ann Lyman for translating portions of Brunhes for me from the original French. Brunhes work is discussed in A. Maass & R. Anderson, . . . and the Desert shall Rejoice: Conflict, Growth, and Justice in Arid Environments 9-10, 399-400 (1978).
192. Whether security of investment is sufficiently quantifiable in dollar terms to be included in calculations is not addressed here. It may be possible, though, to identify different parcels of irrigated land which are essentially identical in all respects except as to the security of supply of the appurtenant water right, and

then ascertain the differing market values of the parcels.

193. Cf. Michelman, Property, Utility and Fairness: Comments on the Ethical Foundations of "Just Compensation" Law, 80 Harv. L. Rev. 1165, 1214 (1967) (identification of "demoralization" as a cost of taking private property without just compensation).
194. E. Mishan, Cost-Benefit Analysis 116 (1976).
195. See notes 38, 120, 143-46, and 153 supra and accompanying text.
196. Morse, Well Pumping and A Declining Water Table - An Economic Analysis (unpublished paper prepared for Water Law, Stanford University, June 1, 1967), excerpted in C. Meyers & A. Tarlock, Water Resource Management 686, 688, (2d ed. 1979). The same type of approach is discussed in Lowe, Ruedisili & Graham, Beyond Section 858: A Proposed Ground-Water Liability and Management System for the Eastern United States 8 Ecology L. Q. 131, 153-55 (1979).
197. See Friedman, The Economics of the Common Pool: Property Rights in Exhaustible Resources, 18 U.C.L.A. L. Rev. 855, 876-79 and 884-86 (1971).
198. See Lowe, Ruedisili & Graham, Beyond Section 858: A Proposed Ground-Water Liability and Management System for the Eastern United States, 8 Ecology L. Q. 131, 153-54 (1979).

199. W. Prosser, Handbook of the Law of Torts 244 (4th ed. 1971), states the traditional approach: "Once it has been established that the defendant's conduct has in fact been one of the causes of the plaintiff's injury, there remains the question whether the defendant should be legally responsible for what he has caused. Unlike the fact of causation, with which it is often hopelessly confused, this is essentially a problem of law. It is sometimes said to be a question of whether the conduct has been so significant and important a cause that the defendant should be legally responsible. But both significance and importance turn upon conclusions in terms of legal policy, so that this becomes essentially a question of whether the policy of the law will extend the responsibility for the conduct to the consequences which have in fact occurred."
200. This last question is asked in Sato, Book Review, 24 Stan. L. Rev. 429, 435 (1972).
201. Restatement (Second) of Torts § 858 (1979). The other two grounds for liability are withdrawing ground water in excess of the land proprietor's reasonable share or unreasonably harming a person entitled to use the water of a water-course or lake with which the groundwater has a direct and substantial connection.

202. Id. Comment f.
203. Alaska Stat. § 46.15.050 (1977).
204. Colo. Rev. Stat. § 37-90-102 (1973); Idaho Code § 42-226 (Supp. 1980).
205. Clark, The Role of State Legislation in Ground Water Management, 10 Creighton L. Rev. 469, 482-83 (1977).
206. E.g., J. Hirshleifer, J. DeHaven, & J. Milliman, Water Supply - Economics, Technology and Policy 61, 64-66 (1960).
207. National Water Commission, Water Policies for the Future 240 (1973).
208. Id.
209. Clark, The Role of State Legislation in Ground Water Management, 10 Creighton L. Rev. 469, 483 (1977).
210. See J. Dales, Pollution Property and Prices 81-84 (1968). The text should not be understood as implying that the National Water Commission was unaware of this point. See National Water Commission, Water Policies for the Future 246 (1973).
211. P. 1 supra.
212. Alaska Stat. § 46.15.080(b)(1977): "In determining the public interest, the commissioner shall consider (1) the benefit to the applicant

resulting from the proposed appropriation; (2) the effect of the economic activity resulting from the proposed appropriation; (3) the effect on fish and game resources and on public recreational opportunities; (4) the effect on public health; (5) the effect of loss of alternate uses of water that might be made within a reasonable time if not precluded or hindered by the proposed appropriation; (6) harm to other persons resulting from the proposed appropriation; (7) the intent and ability of the applicant to complete the appropriation; and (8) the effect upon access to navigable or public waters."

213. F. Trelease, A Water Code for Alaska 17 (1962), excerpted in F. Trelease, Cases and Materials on Water Law 146, 148 (3d ed. 1979).
214. C. Corker, supra note 2, at xviii: "The most that can be hoped is mechanisms which permit flexible and ad hoc solutions applicable to a particular basin, designed to achieve maximum net benefit and to avoid offending community concepts of distributive justice."
215. See generally Hines, Nor Any Drop to Drink: Public Regulation of Water Quality, 52 Iowa L. Rev. 186, 200-01 (1966).
216. E.g., Alaska Stat. § 46.15.020(b)(1) (1977); Mont. Code Ann. §§ 85-2-113(2), -507(4) (1979);

- Nev. Rev. Stat. §§ 534.020(2),-.120(1)(1979);
Wyo. Stat. Ann. § 41-3-909(a)(i)(1977).
217. Colo. Rev. Stat. § 37-90-111(1)(b) (1973);
Idaho Code §§ 42-226, -237a(g)(1977 and Supp.
1980).
218. E.g., Kan. Stat. Ann. § 82a-711a (1977) ("in
determining such reasonable . . . lowering of
the static water level in a particular area, the
chief engineer shall consider . . . "); Nev. Rev.
Stat. § 534.110(4)(1979) ("In determining such
reasonable lowering of the static water level in
a particular area, the state engineer shall
consider. . . .")
219. See note 194, supra and accompanying text.
220. Cf. C. Corker, supra note 2 at 260 ("In part,
the problem [of avoiding rescue projects to
relieve the distress caused by groundwater
mining] is hydrologic. But in larger part, the
problem is in effectively and convincingly
communicating the conclusions about hydrologic
information which is available. A community
dependent on mined groundwater should be aware
of that fact, at as early a date as possible,
and with all the dimensions of the problem that
are discoverable.")
221. Idaho Water Resource Board, The Objectives:
Part One of the State Water Plan (1974); Idaho

Water Resource Board,

The State Water Plan -

Part Two (1976).

222.

Idaho Water Resource Board,

The State Water

Plan - Part Two vii, 5 (1976).