ment of a legal regime aimed at regulating the commercial exploitation of the natural resources of the Moon and other celestial bodies. The setting up of such a legal regime should not be further postponed. The exploitation of extraterrestrial resources may generate significant benefits not only for those directly involved in the mining activities but also for humankind as a whole. This opportunity cannot be wasted due to the absence of a legal framework ensuring the orderly, safe, and profitable development of extraterrestrial exploitative activities.

ACCESS TO WATER ON THE MOON: LESSONS FROM WATER LAW IN HAWAI'I AND ELSEWHERE

Jon M. Van Dyke[*]

I. INTRODUCTION

The discovery during the past year of substantial amounts of water ice in the craters of the Moon's south and north poles, and in a thin layer across much of the lunar surface,[1] has opened up the possibilities of lengthy exploration of the moon by humans and future human settlements. The water ice will be accessible for drinking water, and can also be broken apart into oxygen for breathing and hydrogen for fuel.[2] Obviously, this water ice will be extremely valuable for the humans on the Moon, and conflicts over ownership seem inevitable. What rules should govern access to this very important resource?

The treaties governing moon and outer space exploration have been based on an idealistic vision of cooperation and shared resources. The 1967 Outer Space Treaty,[3] which has been ratified by 99 countries and signed by another 27 (as of 2009), contains the following key provisions:

Article I

> The exploration and use of outer space, including the moon and other celestial bodies, shall be carried out *for the benefit and in the interests of all countries*, irrespective of their degree

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[1] Kenneth Chang, *Scientists See Fresh Evidence of More Water on the Moon,* N.Y. TIMES, March 9, 2010, at D3, col. 1.

[2] *Id.*

[3] Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, *opened for signature* Jan. 27, 1967, 610 U.N.T.S. 205, 18 U.S.T. 2410, T.I.A.S. No. 6347 (1967) [hereinafter Outer Space Treaty].

> of economic or scientific development, and shall be the province of all mankind.

Outer space, including the moon and other celestial bodies, shall be free for exploration and use by all States without discrimination of any kind, on a basis of equality and in accordance with international law, and there shall be *free access* to all areas of celestial bodies….

Article II

> Outer space, including the moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means.

Article IX

> In the exploration and use of outer space, including the moon and other celestial bodies, States Parties to the Treaty *shall be guided by the principle of co-operation and mutual assistance* and shall conduct all their activities in outer space, including the moon and other celestial bodies, *with due regard* to the corresponding interests of all other States Parties to the Treaty. …If a State Party to the Treaty has reason to believe that an activity or experiment planned by it or its nationals in outer space…would cause potentially harmful interference with activities of other States Parties in the peaceful exploration and use of outer space…it *shall undertake appropriate international consultations* before proceeding with any such activity or experiment…. [Emphasis added.]

Similarly, the 1979 Moon Treaty,[4] which (as of 2009) has been ratified by 13 countries and signed by another four, contains the declaration that the Moon and its natural resources are "the common heritage of mankind" and that its resources should be exploited only pursuant to an international regime established by the contracting parties.[5]

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[4] Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, *opened for signature* Dec. 18, 1979, 1363 U.N.T.S. 21.

[5] *Id.* at art. 11.

Is it realistic to expect countries to follow these idealistic provisions when the rush for scarce resources is extended to the Moon, especially in the context of the water ice, which will be crucial for future exploration and exploitation? What rules of international law govern this question, and where can we look for appropriate analogies and models?

II. THE DUTY TO COOPERATE

The duty to cooperate is one of the central and most venerable principles of international law, and it will certainly be applicable to any exploration and exploitation of the Moon's water resources, whether such activities are conducted pursuant to the treaty regime or customary international law.[6] As Professor Boyle has explained in simple and direct terms, "States are required to co-operate with each other in controlling transboundary pollution and environmental risks."[7] Principle 24 of the Stockholm Declaration states:

> International matters concerning the protection and improvement of the environment *should be handled in a co-operative spirit by all countries*, big and small, on an equal footing. Co-operation through multilateral or bilateral arrangements or other appropriate means is essential *to effectively control, prevent, reduce and eliminate adverse environmental effects* resulting from activities conducted in all spheres, in such a way that due account is taken of the sovereignty and interests of all States.[8]

This principle was utilized by the arbitral tribunal in the 1957 *Lac Lanoux Arbitration*[9] which held that, as a matter of customary international law, a state engaging in behavior likely

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[6] Some of the material that follows is adapted from Jon M. Van Dyke, *Liability and Compensation for Harm Caused by Nuclear Activities,* 35 DENVER J. OF INT'L L. & POL'Y 13-46 (2006).

[7] Alan E. Boyle, *Nuclear Energy and International Law: An Environmental Perspective*, 60 BRIT. Y.B. INT'L L. 257, 278 (1990).

[8] U.N. Conference on the Human Environment, June 5-16, 1972, *Declaration of Principles*, Principle 24, U.N. Doc. A/CONF.48/14 (June 16, 1972) (emphasis added).

[9] Affaire du Lac Lanoux [Lake Lanoux Arbitration] (Fr. v. Spain), 12 R.I.A.A. 281 (1957).

to impact the environment of another state significantly is obliged to involve the affected state in discussions regarding these activities. Inherent in this process is the duty to listen to the concerns expressed by the affected nations along with their ideas about how best to reduce the risks. Suggestions that are helpful and constructive should of course be accepted and acted upon. If a country rejects a suggestion, it should explain its rejection it. These consultations are designed to anticipate and reduce risks. Preparing contingency plans for emergencies can only be done after a full understanding of the dangers involved. A nation that is consulted about a project outside its borders does not have a veto power over that project, but it does have the right to understand the risks created by the project and to offer constructive advice about how best to reduce those risks.

The duty to cooperate includes the duty to notify other affected countries,[10] the duty to exchange information, the duty to listen to the concerns of affected countries, the duty to respond to these concerns, and the duty to negotiate in good faith.[11] In some situations, countries also have the duty to reach an agreement, and a duty to submit the dispute to third-party adjudication if they cannot resolve the matter.[12] The International Court of Justice recognized this duty to inform in the *Corfu Channel Case,*[13] ruling that when a State becomes aware that its activities are causing or are likely to cause damaging pollution to the marine environment, it shall immediately notify other

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[10] Rio Declaration on Environment and Development, June 14, 1992, U.N. Doc. A/CONF.151/5/Rev.1 (1992), 31 I.L.M. 874 (1992), Principle 19: "States shall provide prior and timely notification and relevant information to potentially affected States on activities that may have a significant adverse transboundary environmental effect and shall consult with those States at an early stage and in good faith." As to the obligation to notify under customary international law as an aspect of the principle of good faith, *see* Hans Lammers, *Transfrontier Pollution and International Law* 110 (Hague Academy of International Law, Centre for Studies and Research in International Law and International Relations, 1986).

[11] In the Case Concerning Pulp Mills on the River Uruguay (Argentina v. Uruguay), Judgment of 20 April 2010, 2010 I.C.J. 1, ¶ 158, *available at* http://www.icj-cij.org/docket/files/135/15877.pdf the International Court of Justice ruled that "Uruguay breached its procedural obligations to inform, notify and negotiate…"

[12] In most cases, "an obligation to negotiate does not imply an obligation to reach an agreement." *Id.* ¶ 150 (*citing* Railway Traffic Between Lithuania & Poland Advisory Opinion, 1931 P.C.I.J., Series A/B, No. 42, at 116).

[13] Corfu Channel Case (U.K. v. Albania), 1949 I.C.J. 4, 22.

States likely to be affected by such damage. Similarly, the Convention on Early Notification of a Nuclear Accidents[14] requires notification of nuclear accidents.

The "no-harm" rule is now a central component of international environmental law, and the International Court of Justice restated this rule in its recent opinion in the *Case Concerning Pulp Mills on the River Uruguay (Argentina v. Uruguay)*:

The existence of the general obligation of States *to ensure* that activities within their jurisdiction and control respect the environment of other States or of *areas beyond national control* is now part of the corpus of international law relating to the environment.[15]

When an activity may have a significant transboundary affect on ocean and coastal waters, the Law of the Sea Convention requires the exchange of information about the proposed activity and the preparation of an environmental impact assessment to disclose the nature of the activity and the attendant risks.[16] The Espoo Convention also requires an environmental impact assessment for activities that are likely to cause a significant transboundary impact.[17] Along these same lines, a State also has a duty to provide prior notification for transboundary shipment of wastes. The Basel Convention[18] and the IAEA Code of Practice on the International Transboundary Movement of Ra-

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[14] Convention on Early Notification of a Nuclear Accident, IAEA Doc. INFCIRC/335, opened for signature at Vienna Sept. 26, 1986, *entered into force* Oct. 27, 1986, 25 I.L.M. 1370 (1986).

[15] Case Concerning Pulp Mills, *supra* note 11, ¶ 193 (*citing* Legality of Nuclear Weapons Advisory Opinion, 1996 I.C.J. 226, 241-42 ¶ 29) (emphasis added).

[16] United Nations Convention on the Law of the Sea, arts. 204-06, Dec. 10, 1982, 1833 U.N.T.S. 397.

[17] Convention on Environmental Impact Assessment in a Transboundary Context, art. 2.1, Feb. 25, 1991, 1989 U.N.T.S. 309 (requiring contracting parties to take all appropriate measures to prevent, reduce, and control significant adverse transboundary environmental impacts from proposed activities.). In the Case Concerning Pulp Mills, *supra* note 11, ¶ 204, the Court said that the requirement to undertake an environmental impact assessment "where there is a risk that the proposed industrial activity may have a significant adverse impact in a transboundary context" "may now be considered a requirement under general international law."

[18] Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal art. 4, Mar. 22, 1989, 28 I.L.M. 649.

dioactive Waste[19] both require a State to notify and obtain the consent of the sending, receiving, and transit States in accordance with their respective laws and regulations.

The duty to cooperate played a central role in the judgment of the International Court of Justice in the *Case Concerning the Gabcikovo-Nagymaros Dam*,[20] which, as described by Professors Birnie and Boyle, had "[t]he effect of…requir[ing] the parties to co-operate in the joint management of the project, and to institute a continuing process of environmental protection and monitoring . . ."[21] These commentators have explained that "[t]he Court's environmental jurisprudence is not extensive but its judgments affirm the existence of a legal obligation to prevent transboundary harm, to co-operate in the management of environmental risks, to utilize shared resources equitably and, albeit less certainly, to carry out environmental impact assessment and monitoring."[22]

The International Tribunal for the Law of the Sea confirmed the importance of the duty to cooperate in two recent cases. In the *MOX Plant Case (Ireland v. U.K.)*, the Tribunal ruled on December 3, 2001, that the duty to cooperate required the two countries to exchange information concerning the risks created by the plant, to monitor the effects of the plant on the marine environment, and to work together to reduce those risks.[23] Similarly in the *Case Concerning Land Reclamation by Singapore In and Around the Straits of Johor*, the Tribunal issued a ruling on October 8, 2003, stating:

> [G]iven the possible implications of land reclamation on the marine environment, *prudence and caution require* that Malaysia and Singapore *establish mechanisms for exchanging information and assessing the risks or effects*

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[19] Int'l Atomic Energy Agency [IAEA], *Code of Practice on the International Transboundary Movement of Radioactive Waste (IAEA Code)*, IAEA Doc. INFCIRC/386 (Nov. 13, 1990).

[20] Gabcikovo Nagymaros Project (Hung. v. Slovk.), 1997 I.C.J. 7, ¶ 147 (Sept. 25).

[21] PATRICIA W. BIRNIE AND ALAN E. BOYLE, INTERNATIONAL LAW & THE ENVIRONMENT 108 (2d ed. 2002).

[22] *Id.*

[23] MOX Plant Case (No. 10) (Ireland v. U.K.), 41 I.L.M. 405 (Int'l Trib. L. of the Sea 2001).

> *of land reclamation works and devising ways to deal with them in the areas concerned.*[24]

To give teeth to this duty to cooperate, the Tribunal went on to prescribe provisional measures that the parties had to comply with:

> Malaysia and Singapore *shall cooperate* and shall, for this purpose, enter into consultations forthwith in order to:
>
> (a) *establish promptly a group of independent experts* with the mandate
>
> (1) *to conduct a study*, on terms of reference to be agreed by Malaysia and Singapore, to determine, within a period not exceeding *one year* from the date of this Order, the effects of Singapore's land reclamation and to propose, as appropriate, measures to deal with any adverse effects of such land reclamation . . .
>
> (b) exchange, on a regular basis, information on, *and assess risks or effects of*, Singapore's land reclamation works . . .[25]

Finally, the Tribunal directed "Singapore not to conduct its land reclamation in ways that might cause irreparable prejudice to the rights of Malaysia or serious harm to the marine environment, taking especially into account the reports of the group of independent experts."[26]

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[24] Concerning Land Reclamation by Singapore In and Around the Straits of Johor (No. 12) (Malay. v. Sing.), 126 I.L.R. 487, ¶ 99 (Int'l Trib. L. of the Sea 2003) (emphasis added).

[25] *Id.* at ¶ 106(1) (emphasis added).

[26] *Id.* at ¶ 106(2).

III. INTERNATIONAL RIVER LAW

Although at one point, the United States promoted the "Harmon Doctrine,"[27] which argued that countries with sovereignty over the upstream portions of rivers owned "their" water and could divert all of it before it reached the next country, this view has been discredited. It is now accepted that river resources should be shared according to the principle of "equitable utilization" and that the interests of countries bordering rivers (riparian states) must be reasonably balanced. It is also widely accepted now that freshwater resources in rivers and streams should not be divided up solely to serve homocentric utilitarian purposes, and that the integrity of natural ecosystems should be protected for their own sake. Among the principles now recognized as governing international shared water resources are:

* The Right to Equitable and Reasonable Use
* The No-Significant-Harm Rule
* The Duty to Inform, Consult, and Negotiate in Good Faith
* The Duty to Prevent and Control Pollution
* The Duty to Protect and Preserve Ecosystems
* The Anticipatory Obligation to Prevent or Mitigate Harmful Conditions

The 1997 U.N. Convention on the Law of the Non-Navigational Uses of International Water Courses,[28] which has been ratified by 13 countries, contains the following important provision:

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[27] The "Harmon Doctrine" was developed by U.S. Attorney General Judson Harmon who proclaimed in 1896 that "the rules, principles and precedents of international law impose no liability or obligation on the United States," in a case involving a claim by Mexico for damages from diverting the water of the Rio Grande. This view was rejected by the Joint Commission established to evaluate this dispute, including the U.S. members, who agreed that "Mexico has been wrongfully deprived for many years of a portion of her equitable rights in the flow of one-half of the waters of the Rio Grande." In 1906, the United States formally rejected this approach when it concluded a treaty with Mexico regulating the sharing of the waters of the Rio Grande. *See* William A. Paddock,*The Rio Grande Convention of 1906: A Brief History of an International and Interstate Apportionment of the Rio Grande*, 77 DENVER U. L. REV. 287 (1999).

[28] U.N. Convention on the Law of the Non-Navigational Uses of International Water Courses, U.N.G.A. Res. 51/229 (May 21, 1997) (emphasis added).

Article 7 – Obligation not to cause significant harm

1. Watercourse States shall, in utilizing international watercourses in their territories, *take all appropriate measures to prevent the causing of significant harm* to other watercourse States.

2. Where significant harm nevertheless is caused to another watercourse State, the States whose use causes such harm shall…take all appropriate measures . . . in consultation with the affected State, *to eliminate or mitigate such harm* and where, appropriate, to discuss the question of *compensation* . . .

IV. U.S. WATER LAW IN GENERAL

The law applicable to water disputes varies greatly in the United States, depending on the amount of water available to a community and the historical approach that has been taken regarding its allocation. Some areas, like the Northeast region of the United States, have abundant water and so disputes regarding allocation are rare. Other areas, such as most of the Western states, have limited water and disputes over water are common and extremely contentious.

In areas where water is abundant, most communities use an approach called "riparianism," whereby a landowner has the right to use water from a watercourse going through the land so long as the use is "reasonable" with respect to the rights of others to water from the same source. In water-short areas, many states use the "appropriation" or "prior appropriation" approach, whereby the first person to initiate a use of water has the first or prior right over all subsequent users, providing that the use remains beneficial, and that water can be diverted from a stream, provided again that it is put to a beneficial use.[29] Under this system, in times of shortage, or if a stream is "over appropriated," the owner of the oldest water right is entitled to maintain its claim to the beneficial use of the water before subsequent users are entitled to any water.[30] Because of the scarcity

[29] R.L. DEWSNUP & D.W. JENSEN, A SUMMARY-DIGEST OF STATE WATER LAWS 35 (1973).

[30] *See, e.g.,* Colo. Const. art. XVI, sec. 6; Colo. Rev. Stat. sec. 37-92-301(3).

of water in these communities, public agencies generally monitor the use of the water carefully, and the water right can revert to the state if the water is not being used for a beneficial purpose. Some states issue water permits for a fixed term of years, such as Florida, which now issues permits for from 20 to 50 years, and New Jersey, which issues permits for 25 years. California,[31] Oklahoma,[32] Oregon,[33] and Texas[34] recognize both the riparian and appropriation doctrines in their regulation of water rights.

V. PRINCIPLES GOVERNING WATER RIGHTS IN HAWAI'I

Water law in Hawai'i has been complicated, because water is abundant in some parts of each island and scarce in others. Before Westerners started arriving in 1778, Native Hawaiians "developed a sophisticated irrigation system . . . and allocated water according to the agricultural needs of the farmers and according to the amount of labor each farmer contributed toward building and maintaining the system of ditches or *auwai*."[35] This system of cooperative work-sharing served the community well, and a "spirit of mutual dependence and helpfulness prevailed, alike among the high and the low, with respect to the use of the water."[36]

As Westerners came to dominate the economic and political life of the islands,[37] they sought to develop sugar as a cash crop, and determined that water from the rainy and mountainous parts of the islands should be transported to the dry plains. Sugar requires an enormous amount of water, so the "Western entrepreneurs quickly acquired land in the rainy parts of the islands and constructed ditches for transporting water that

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[31] Dewsnup & Jenson, *supra* note 29, at 129-154.

[32] *Id.* at 603-618.

[33] *Id.* at 619-636.

[34] *Id.* at 699-714.

[35] Jon M. Van Dyke *et al., Water Rights in Hawai'i, in* LAND AND WATER RESOURCE MANAGEMENT IN HAWAI'I.
I 141, 143 (Hawai'i Institute for Management and Analysis in Government 1979).

[36] Antonio Perry, *Hawaiian Water Rights,* 23 YALE L.J. 437, 442 (1914).

[37] *See generally* JON M. VAN DYKE, WHO OWNS THE CROWN LANDS OF HAWAI'I? (University of Hawaii Press, 2008).

were the engineering marvels of their day."[38] The Native Hawaiians were thereby deprived of the water they needed to grow their traditional staple crop of kalo (taro), but the courts, which had become dominated by Westerners linked to the sugar planters, ruled in a series of cases that landowners owned the water linked to the land and could transport that water to distant areas.[39]

When Hawai'i once again became self-governing with statehood in 1959, its Supreme Court began reexamining decisions made during the territorial period (1898-1959) and determined that Hawai'i's law should be guided by the values established by Native Hawaiians prior to the arrival of Westerners, and that water was not a commodity that could be "owned" and freely transported, but should instead be viewed as a public good to be governed by the public for the good of all.[40] This decision led to substantial controversy, but eventually the Hawai'i Legislature enacted a Water Code and established the Commission on Water Resource Management, which has the power to determine water allocation. The Water Commission is empowered to declare "water management areas" in water-short areas, and water can be taken from streams in those areas only pursuant to permits from the Commission. These permits are issued only after an applicant establishes that the proposed use of the water:

> (1) can be accommodated with an available water source;
>
> (2) is a reasonable-beneficial use as defined in section 174-5;[41]
>
> (3) will not interfere with an existing legal use of water;
>
> (5) is consistent with the public interest;
>
> (6) is consistent with state and county general plans and land use designations;

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[38] Van Dyke, *Water Rights, supra* note 35, at 143.

[39] *See, e.g.,* Territory v. Gay, 31 Hawai'i 376 (1930).

[40] McBryde Sugar Co. v. Robinson, 54 Hawai'i 174, 504 P.2d 1330 (1973), aff'd *on rehearing,* 55 Hawai'i 260, 517 P.2d 26 (1973), *cert denied,* 417 U.S. 962 (1974).

[41] "Reasonable-beneficial use" is "the use of water in such quantity as is necessary for economic and efficient utilization, for a purpose, and in a manner which is both reasonable and consistent with the state and land use plans and the public interest." Hawai'i Revised Statutes, § 174C-3.

> (7) is consistent with county land use plans and policies; and
> (8) will not interfere with the rights of the department of Hawaiian home lands.[42]

The Water Code gives priority to using water for "domestic uses" and "municipal uses" that serve the public interest,[43] and the Hawai'i Supreme Court has emphasized the underlying principles of the public trust doctrine that apply to all uses of water.[44] As the Court has explained, the public trust is a "title different in character from that which the State holds in lands intended for sale . . . The control of the state for purposes of the trust can never be lost."[45] The public trust doctrine requires that "any balancing between public and private purposes begin with a presumption in favor of public use, access, and enjoyment."[46] This doctrine does not "safeguard rights of exclusive use for private commercial gain."[47]

A number of controversies have reached the Hawai'i Supreme Court, and it has issued several long opinions explaining that water is indeed a public trust resource, that its allocation should be guided by the precautionary principle; that while private parties can have usufructory rights in water, they do not have vested rights; and that water can be reallocated as the public good requires. Private rights to water are only "usufructory" in nature because of the practical realities of flowing water.

> It is generally recognized that a simple private ownership model of property is conceptually incompatible with the actualities of natural watercourses. Rather, the variable and transient nature of the resource, as well as the necessity of preserving its purity and flow for others who

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[42] Hawai'i Revised Statutes, § 174C-49.

[43] *Id.* § 174C-2(c); In the Matter of the Water Use Permit Applications, Petitions for Interim Instream Flow Standard Amendments, and Petitions for Water Reservations for the Waiahole Ditch Combined Contested Case Hearing, 94 Hawaii 97, 136, 9 P.3d 409, 449 (2000) (hereinafter *Waiahole I*).

[44] *Waiahole I, supra* note 43.

[45] *Id.* at 128 (internal quotation marks and citations omitted).

[46] *Id.* at 142.

[47] *Id.* at 138.

> are entitled to its use and enjoyment have led to water rights being uniformly regarded as usufructory and correlative in nature.[48]

Under the Water Code, the distribution and sale of surface water out of its original watershed is authorized only after appropriate permits have been issued allowing such diversions as reasonable and beneficial uses of the water. Such permits remain subject to alteration by the Water Commission in light of changing future conditions, changing demands for this water, and changing evaluations of the appropriate amount of the water that should remain instream.[49]

A. Reppun v. Board of Water Supply (1982)

The status of surface water is discussed and explained most clearly in *Reppun v. Board of Water Supply*.[50] The Hawai'i Supreme Court responded to the argument that surface water could be "transformed into a freely transferable private commodity," by saying that "we do not find this to be so."[51] The Court went on to say that "the creation of an independent source of profit for the possessors of water rights was not included among [the] purposes" for permitting rights in water under Section 7-1 of the Hawai'i Revised Statutes.[52] Section 7-1 "was originally enacted in 1850 as section 7 of what has come to be known as the Kuleana Act,"[53] and it provides that:

> The people shall also have a right to drinking water, and running water, and the right of way. The springs of water, running water, and roads shall be free to all, on all lands granted in fee simple; provided that this shall not

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[48] Robinson v. Ariyoshi, 65 Hawai'i. 641, 667, 658 P.2d 287, 305-06 (1982).

[49] "[T]he continuing *authority* of the state over its water resources . . . empowers the state to revisit prior diversions and allocations, even those made with due consideration of their effect on the public trust." *Waiahole I*, *supra* note 43, 94 Hawai'i at 141, 9 P.3d at 453.

[50] Reppun v. Board of Water Supply, 65 Hawaii 531, 656 P.2d 57 (1982).

[51] *Id.* at 539, 656 P.2d at 63.

[52] *Id.* at 550, 656 P.2d at 70.

[53] *Id.* at 549, 656 P.2d at 69.

> be applicable to wells and watercourses, which individuals have made for their own use.[54]

The Hawai'i Supreme Court also emphasized an earlier sentence of section 7-1 "referring specifically to other articulated rights" which "provides that privileges enumerated in that section were 'for their [the people's] own use, but they shall not have the right to take such articles to sell for profit.'"[55] Based on this analysis, the Court concluded that "the riparian water rights created by HRS § 7-1 were not intended to be, and cannot be, severed from the land in any fashion."[56]

B. Robinson v. Ariyoshi (1982)

Similar conclusions are found in *Robinson v. Ariyoshi.*[57] The Hawai'i Supreme Court explained that rights to water were "usufructory interests," which are "not so broad as to include any inherent enforceable right to transmit water beyond the lands to which such private interests appertained."[58] The Court provided the following explanation as to why water rights have traditionally been viewed as "usufructory" rather than absolute in nature:

> It is generally recognized that a simple private ownership model of property is conceptually incompatible with the actualities of natural watercourses. Rather, the variable and transient nature of the resource, as well as the necessity of preserving its purity and flow for others who are entitled to its use and enjoyment have led to water rights being uniformly regarded as usufructory and correlative in nature. See Maloney, Ausness & Morris, A Model Water Code, 81 (1972); Trelease, *Government*

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[54] Hawai'i Revised Statutes, § 174C-1 (2010).

[55] *Reppun v. Board of Water Supply, supra* note 50, at 550, 656 P.2d at 70.

[56] *Id.*

[57] *Robinson v. Ariyoshi*, 65 Hawaii 641, 658 P.2d 287 (1982).

[58] *Id.* at 648, 658 P.2d at 294-95 (referring to its previous decision in *McBryde Sugar Co. v. Robinson*, 54 Hawaii 174, 191, 198, 504 P.2d 1330, 1341, 1344 (1973)).

Ownership and Trusteeship of Water, 65 Cal. L. Rev. 638, 640 (1957).[59]

Because water rights are usufructory, they are subject to reevaluation in light of the public interest, and any "change in any aspect of the utilization of a private water right has always been understood as dependent upon such a change not injuriously affecting the rights of others."[60] Because the rights and interests of others may change based on changes in climatic conditions and other surrounding factors, "no transfer of water could therefore be secure. It is therefore difficult to speak of there having existed an enforceable right to transfer water from the lands to which water rights attached."[61] The Court's closing sentence in the *Robinson* opinion says that the 1973 *McBryde* opinion "made clear that underlying every private diversion and application there is, as there always has been, a superior public interest in this natural bounty."[62]

C. The Waiahole Ditch Case (2000)

The Hawai'i Supreme Court restated these basic principles in its monumental opinion in the *Waiahole Ditch Case,* which concerned the transfer of water on Oahu.[63] No permanent or unchallengeable right to divert surface water from streams exists, the Court explained, because "[t]he continuing *authority* of the state over its water resources precludes any grant or assertion of vested rights to use water to the detriment of public trust purposes."[64] "This authority empowers the state to revisit prior diversions and allocations, even those made with due consideration of their effect on the public trust."[65] Any claim by a private

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[59] *Id.* at 667, 658 P.2d at 305-06.
[60] *Id.* at 649 n. 8, 658 P.2d at 295 n.8.
[61] *Id.*
[62] *Id.* at 677, 648 P.2d at 312.
[63] *Waiahole I, supra* note 43.
[64] *Id.,* 94 Hawai'i at 141, 9 P.3d at 453 (emphasis in original*, citing Robinson v. Ariyoshi,* 65 Hawaii at 677, 658 P.2d at 312, and *quoting from Kootenai Envtl. Alliance v. Panhandle Yacht Club, Inc.,* 105 Idaho 622, 671 P.2d 1085, 1094 (1983), for the proposition that "[t]he public trust doctrine takes precedent even over vested water rights.").
[65] *Id.*

landowner for a permit must be evaluated in light of "the public interest in instream flows."[66]

The Hawai'i Supreme Court reiterated again that water rights are "usufructory" and are always subject to reevaluation:

> Consequently, depending on the situation, a landowner could be entitled to certain uses of water but not others. Even established uses could fall into disfavor. A severe shortage could foreclose use altogether. Usufructory water rights, in sum, "have always been incomplete property rights, so the expectations of [rightholders] to the enjoyment of these rights are generally weaker than the expectation of the right to exploit the full value of dry land" [A. Dan] Tarlock, [*Law of Water Rights and Resources*], §3:92, at 3-153 [(2000)].[67]

Because rights to water are only usufructory rights, landowners have no absolute or unchallengeable right to transfer, sell, or divert the waters from their lands.[68]

When it passes on water permit applications, the Water Commission has the responsibility to balance the importance of maintaining the streams as robust ecological systems with the water requirements of those residences and businesses located away from the streams. In its *Waiahole Ditch* decisions, the Hawai'i Supreme Court emphasized that interim stream standards "must still protect instream values to the extent practicable" and "must still provide meaningful protection of instream

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[66] *Id.* at 161, 9 P.3d at 473 (*referring to Shokal v. Dunn*, 109 Idaho 330, 707 P.2d 441, 450 (1985) ("[T]he burden of proof in all cases as to where the public interest lies . . . rests with the applicants")).

[67] *Id.* at 181.

[68] Language in *Robinson v. Ariyoshi,* 753 F.2d 1468 (9th Cir. 1985) that might arguably be viewed as inconsistent, as related to waters on Kauai governed by other Hawaii decisions issued during the territorial period, was explicitly vacated by the U.S. Supreme Court in *Ariyoshi v. Robinson*, 477 U.S. 902 (1986), and the underlying federal case was subsequently dismissed as unripe. *Robinson v. Ariyoshi*, 887 F.2d 215 (9th Cir. 1989). The Ninth Circuit subsequently denied attorneys' fees in that case, explaining explicitly that "[t]o win fees, plaintiffs must prevail in some significant way. That did not happen in the case at bar." *Robinson v. Ariyoshi*, 933 F.2d 781. 786 (9th Cir. 1991).

uses."[69] In *Waiahole II*, the Supreme Court criticized the Water Commission's decision to restore half the water in the stream by saying that the Commission had not established that such a restoration would be "sufficient to protect instream values," and pointing out that the assumption that half would be sufficient "appears to be arbitrary and speculative," thus indicating that it may be necessary to restore more than half of the stream water.[70]

Central to the balancing process is the examination of alternative sources of water which could be used instead of the stream water, with the burden placed squarely on the party seeking to divert water away from existing streams to show the absence of alternative sources of water. In both *Waiahole I* and *Waiahole II*, the Hawai'i Supreme Court emphasized that:

> besides advocating the social and economic utility of their proposed uses, permit applicants must also *demonstrate the absence of practicable mitigating measures, including the use of alternative water sources*. Such a requirement is intrinsic to the public trust, the statutory instream use protection scheme, and the definition of 'reasonable-beneficial' use, and is an essential part of any balancing between competing interests.[71]

In *Waiahole II,* the Supreme Court concluded that the Commission had not established that the Campbell Estate had clearly articulated the alternatives and demonstrated that they were not practicable. The Court said that the Commission "must determine whether the alternative is available and capable of being utilized after considering cost, technology, and logistics."[72]

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[69] *See* In the Matter of Water Use Permit Applications…for the Waiahole Ditch Combined Contested Case Hearing (Waiahole II), 105 Hawaii 1, 11, 93 P.3d 643, 653 (2004).

[70] *Id.*

[71] *Id.* at 15, 93 P.3d at 657 (emphasis provided in *Waiahole II, quoting from Waiahole I*, 94 Hawaii at 161, 9 P.3d at 473).

[72] *Id*. at 19, 93 P.3d at 661.

D. Na Wai Eha (The Great Waters), West Maui

On June 10, 2010, Hawai'i's Commission on Water Resource Management issued a 226-page opinion regarding the allocation of waters from four streams in the West Maui mountains that flow into central Maui.[73] These streams, which were called Na Wai Eha (The Great Waters) by Native Hawaiians because of the amount of flow they produced, have been transformed into modest trickles during the past century so that their waters can be transported into the drier central Maui plains to irrigate sugar fields. Because some of the sugar plantations have closed down, it became possible to restore much of the water to the streams, but the Water Commission has declined to do so, and much of the water will continue to be diverted to the remaining sugar fields (with some also being used for the domestic purposes of Maui residents). The one dissenting commissioner, Dr. Lawrence Miike, sharply criticized the Commission's decision saying that it had ignored its responsibilities to protect the integrity of the stream ecosystems and give the natural system a chance to recover. This decision is certain to be appealed, and so Hawai'i's appellate courts will have another opportunity to evaluate the principles that should govern the division and allocation of Hawai'i's water resources.

VI. PRECAUTIONARY PRINCIPLE

The precautionary principle (sometimes called the precautionary approach), which has evolved into a customary international law norm,[74] was confirmed in Principle 15 of the Rio Declaration, which states:

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[73] *Iao Ground Water Management Area High-Level Source Water-Use Permit Applications and Petition to Amend Interim Instream Flow Standards of Waihee River and Waiehu, Iao, & Waikapū Streams Contested Case Hearing, Commission on Water Resource Management,* State of Hawai'i, CCH-MA06-01, Findings of Fact, Conclusions of Law, and Decision and Order, June 10, 2010.

[74] *See, e.g.,* Jon M. Van Dyke, *The Evolution and International Acceptance of the Precautionary Principle, in* BRINGING NEW LAW TO OCEAN WATERS 357, 357 (David D. Caron and Harry N. Scheiber eds., 2004).

> In order to protect the environment, the precautionary approach shall be widely applied *by States* according to their capabilities. Where there are threats of serious or irreversible damage, *lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.*[75]

This principle continues to develop and is presently seen as an authoritative norm recognized by governments and international organizations as a firm guide to activities affecting the environment. It flows directly from the responsibility of "due diligence" that is a component of the no-harm rule and it constitutes "an obligation of diligent prevention and control."[76] The essential components of the precautionary principle are:

- Developments and initiatives affecting the environment should be thoroughly assessed before action is taken.
- The burden is on the developer or initiator to establish that the new program is safe.
- Alternative technologies should be explored.
- The absence of full scientific certainty should not limit precautionary measures to protect the environment.
- Whenever serious or irreversible damage is anticipated, the action should be postponed or canceled.

The precautionary principle has been somewhat controversial, because some commentators view it as being too vague,[77] and others view it as unrealistic, but it is a major presence at all international negotiations now, and it appears regularly in trea-

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[75] Rio Declaration, *supra* note 10, at Princ. 15 (emphasis added).

[76] BIRNIE & BOYLE, *supra* note 21, at 115.

[77] *See, e.g.,* Daniel Bodansky, *Scientific Uncertainty and the Precautionary Principle*, 33 ENV'T 4, 8 (Sept. 1991) ("Although the precautionary principle provides a general approach to environmental issues, it is too vague to serve as a regulatory standard because it does not specify how much caution should be taken."). *But see* Daniel Bodansky, *Remarks: New Developments in International Environmental Law*, 85 AM. SOC'Y INT'L L. PROC. 401, 413 (1991) ("Indeed, so frequent is its invocation that some commentators are even beginning to suggest that the precautionary principle is ripening into a norm of customary international law."). *See generally* James E. Hickey, Jr. & Vern R. Walker, *Refining the Precautionary Principle in International Environmental Law,* 14 VA. ENVTL. L.J. 423 (1995) and Gregory D. Fullem, *The Precautionary Principle: Environmental Protection in the Face of Scientific Uncertainty*, 31 WILLAMETTE L. REV. 495 (1995).

ties and documents because it reflects the view that it is necessary to be extra vigilant in our stewardship of resources, especially in light of the many mistakes we have made in recent years.[78] Although the content of the precautionary principle is still the subject of discussion, at a minimum it serves to reverse the burden of proving that a certain activity does not or will not cause damage onto the state seeking to initiate an environmentally sensitive activity. As Judge Wolfrum expressed in his separate opinion in the *MOX Plant Case*:

> There is no general agreement as to the consequences which flow from the implementation of this principle *other than* the fact that the burden of proof concerning the possible impact of a given activity is reversed. A State interested in undertaking or continuing a particular activity has to prove that it will result in no harm, rather than the other side having to prove that it will result in harm.[79]

Certainly the inclusion of the precautionary standard in the 1996 Protocol to the London Dumping Convention[80] and in the 1995 Straddling and Migratory Fish Stocks Agreement[81] provides strong evidence that this approach is here to stay.[82] The

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[78] *See generally* Jon M. Van Dyke, *Applying the Precautionary Principle to Ocean Shipments of Radioactive Materials*, 27 OCEAN DEV. & INT'L L. 379 (1996).

[79] *MOX Plant Case (No. 10) (Ir. v. U.K.),* 41 I.L.M. 405, 428 (Int'l Trib. L. of the Sea 2001) (opinion of Judge Wolfrum) (emphasis added).

[80] 1996 Protocol to the 1972 Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, art. 3, Nov. 7, 1996, 36 I.L.M. 1 (reversing the presumptions established in the original convention, so that the dumping of all wastes is prohibited unless the item to be dumped is explicitly listed in Annex I).

[81] Agreement for the Implementation of the Provisions of the U. N. Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, arts. 5(c) and 6, Sept. 8, 1995, U.N. Doc. A/CONF.164/37, 34 I.L.M. 1542 (listing the "precautionary approach" among the principles that govern conservation and management of shared fish stocks and elaborating on this requirement in some detail, focusing on data collection and monitoring).

[82] *E.g.,* Western Pacific Regional Fishery Management Council, *A 20-Year Report* 26 (1998) (stating proudly that the Council has established "a precautionary management approach to fishery conservation and management" as evidenced by its establishment of a moratorium and then a limited-entry program "in response to the rapid entry of longline vessels into the Hawaii-based fleet").

principle has been so universally included in recent treaties that it now appears to have been accepted as a norm of customary international law that is formally binding on all nations.[83] Several judges on the ICJ have recognized the precautionary principle as an emerging concept in international law in cases such as the 1995 *Nuclear Tests Case*[84] and the 1996 *Nuclear Weapons Case*.[85]

The Hawai'i Supreme Court has also recognized the importance of the precautionary principle with regard to decisions affecting the allocation of water. In 2000, it explained that *"the precautionary principle simply restates the [Water] Commission's duties under the [Hawai'i] constitution and [Hawai'i's Water] Code*. Indeed, *the lack of full scientific certainty* does not extinguish the presumption in favor of public trust purposes or vitiate the Commission's affirmative duty to protect such purposes whenever feasible."[86]

> *As with any general principle, its meaning must vary according to the situation and can only develop over time.* In this case, we believe the [Water] Commission describes *the [precautionary] principle in its quintessential form*: at minimum, *the absence of firm scientific proof should not tie the Commission's hands in adopting reasonable measures designed to further the public interest.*[87]

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[83] *See generally* Van Dyke, *The Evolution and International Acceptance of the Precautionary Principle, supra* note 74.

[84] Request for Examination of Situation in Accordance with Paragraph 63 of Court's Judgment of 20 December 1974 in the Nuclear Tests (N.Z. v. Fr.), 1995 I.C.J. 288, 342, 412 (Sept. 22) (dissenting opinion of Judge Weeramantry) (stating the precautionary principle is "gaining increasing support as part of the international law of the environment"); (dissenting opinion of Judge Palmer) (stating "the norm involved in the precautionary principle has developed rapidly and may now be a principle of customary international law relating to the environment").

[85] Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, 1996 I.C.J. 226, 502 (July 8) (dissenting opinion of Judge Weeramantry) (stating "principles of environmental law, which this Request enables the Court to recognize and use in reaching its conclusions, [include] the precautionary principle").

[86] *Waiahole I, supra* note 43, 94 Hawai'i at 155 (emphasis added).

[87] *Id.* (emphasis added).