

ENVIRONMENTAL RISK IN  
INDIAN COUNTRY

by

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## ABSTRACT\*

Environmental risks for American Indians are different than those experienced by the majority of Americans due to a variety of factors. Based on an examination of population, health, economic, social and cultural characteristics, the following sources and impacts of such risks are described:

- risks to health from poverty and unique exposure pathways, such as consumption of contaminated fish;
- risks to a land based economy, stemming from the economic impacts of environmental degradation to subsistence and natural resource based economies;
- risks from lack of environmental infrastructure due to inadequate tribal resources, expertise, and planning mechanisms to deal with increasing pressure for economic development;
- future risks to reservation environments, based on young and quickly growing populations on a limited land base; and
- risks from nonIndian lands which impact reservations through cross-boundary air and water pollution, and through direct impacts on off-reservation sacred sites.

The paper argues that EPA's current methods for assessing risk are inappropriate for Indian lands because (1) they represent a "snapshot" of a particular point in time and do not capture cumulative or future risk; (2) they are population-based, and therefore tend to overlook the distribution of environmental risk, an issue central to environmental equity concerns; and (3) they focus primarily on health risks, and do not address the cultural and economic impacts of environmental damage on Indian tribes. The paper concludes that EPA should amend its risk analysis process to take these factors into account, and that tribes should be allocated additional resources to bring their environmental management capabilities up to the level of the states.

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\* A longer version of this paper, which includes additional details and sources, is available from the National Indian Coordinator, Office of Federal Activities, Environmental Protection Agency, Washington, D.C. 20460, or from the Natural Sciences Library, University of Michigan, Ann Arbor, MI.

"Like the miner's canary, the Indian marks the shifts from fresh air to poison gas in our political atmosphere; and our treatment of Indians, even more than our treatment of other minorities, reflects the rise and fall in our democratic faith."

--Felix S. Cohen  
author, Handbook on Indian Law

## CHAPTER 1. INTRODUCTION

### Why a cultural approach to risk?

Over the past decade, the U.S. Environmental Protection Agency (EPA) has begun to adopt environmental risk as a framework for identifying and ranking problems that pose a danger to human health and the environment. While this scientific framework has proven generally effective in this task, it is incomplete. In recent years, activists and social scientists have voiced concerns that racial minorities and poorer members of American society are shouldering a disproportionate amount of the environmental pollution generated by industries, agriculture, and cities (Bryant and Mohai, 1991). Investigating these concerns requires a new approach towards risk, one that incorporates a local perspective; a focus on processes, as well as products; and on the differences between one group of people and another. The purpose of this paper is to ask how Native Americans are different from the population at large, and what these differences can tell us about environmental risks in Indian country.

### Why Native Americans?

While disproportionate environmental impacts should be investigated for all groups at-risk, Native Americans have a unique cultural and legal claim in U.S. history, and cannot be treated as simply one among many ethnic or socioeconomic groups. Native Americans are the continent's original inhabitants, having a history and a relationship with the land dating back thousands of years. Despite the massive disruptions and dislocations of the past five centuries, Indian tribes remain, for the most part, a people tied to the land. Relying upon a particular parcel of land for livelihood and community, tribes have far more to lose from environmental degradation than the typical

less-rooted urban American. Finally, tribes have a unique legal status, and are recognized as sovereign governments by the U.S. Congress and federal courts (Eberhard, 1990). This status is the foundation for the EPA Indian Policy, which states that the Agency will deal with tribes on a government to government basis, as it does with states.

This paper highlights important characteristics that make American Indians particularly vulnerable to certain health, ecological and economic risks from environmental degradation. It is hoped that raising these issues will assist in the development of a model for adapting the framework of comparative risk analysis to more equitably include racial or low-income groups that may experience different risks than the population at large. For reasons discussed below, the health and economic impacts of environmental risk are different for American Indians than for the general population. Moreover, American Indians may perceive risks differently from other groups, due to their cultural and historical experiences. Ecological risks are not considered here, because the impacts of a particular hazard on the environment remain the same, regardless of the population group affected. What may differ are the cultural, health, and economic impacts of that environmental degradation.

Although ecological risks are not considered here, it should be noted that Native Americans occupy some of the most ecologically valuable land in the country, much of which is still largely untouched by environmental degradation. The development of tribal capabilities to manage these lands is critical for the minimization of ecological risk, and underlies many of the issues discussed in this paper.

### **Federal Indian Policy and Environmental Protection**

EPA is charged with implementing federal environmental laws by establishing national standards. The Agency may delegate the responsibility for managing programs to meet those standards to state, tribal and territorial governments. Before 1984, EPA's regulatory programs did not take into account the unique constitutional status of Indian lands (Price, 1983). In addition, most of EPA's authorizing legislation had no language addressing responsibility for

environmental protection on Indian lands. As a result, while EPA fostered its partnership with the states, environmental protection on Indian lands often lagged behind.

The low priority of environmental problems on Indian lands can be traced in part to the confusion over jurisdiction on Indian reservations. In laws dating back to the 18th century, the federal government has asserted itself as the primary authority over Indian tribes and tribal lands. In the "Doctrine of Discovery" cited in 1823, Chief Justice Marshall wrote that Indian tribes' "rights to complete sovereignty as independent nations, were necessarily diminished" by the "discovery" of tribes and their lands by European colonists (*Johnson v. McIntosh*, 1823). However, Felix Cohen, the pre-eminent scholar of federal Indian law has noted that Indian tribes never relinquished their powers of self-government, and that these powers are neither derived from nor controlled by the U.S. Constitution (cited in Wharton, 1989).

The trust relationship existing today between Indian tribes and the federal government has its roots in the discovery doctrine and the explicit promises made to tribes in many treaties. This trust relationship obligates the federal government to act in the tribes' interest when acting as a trustee for Indians and their lands. However, this responsibility coexists with Congress' plenary power over Indian tribes which is derived from Article 1 (the commerce clause) of the Constitution. This authority was exercised freely during the 19th and early 20th centuries, enabling Congress to repeatedly abrogate treaty agreements (Wharton, 1989). The tension between these two principles of the Federal-Indian relationship, representing federal obligation to and power over tribes, is still evident in many federal decisions today.

Over time, administrative and judicial decisions have complicated the tribal-federal relationship by granting certain rights to states, such as limited jurisdiction over certain reservations (*Oliphant v. Suquamish Indian Tribe*, 1978). Moreover, even when states have not made jurisdictional claims, few tribes possessed the resources and training to fully exercise authority over the programs and problems on reservations.

Another reason for the low priority of environmental issues on Indian lands has been that most are located in rural areas, and have experienced relatively minor or localized environmental problems compared to the states and their cities. In recent years, however,

increasing pressure to exploit energy resources and other natural resources on tribal lands has increased the potential for serious environmental problems.

Beginning in the late 1960s, the federal government embarked on a policy to encourage and support Native American efforts to become more self-sufficient. While the implementation of this policy has been slow and irregular, the current EPA Indian policy is an outgrowth of this trend. EPA is the first federal agency to begin implementing President Reagan's Indian policy, published in January 1983. This policy states that:

- Federal activities will endeavor to foster self-determination and self-government among Indian tribes; and
- Indian tribes will be dealt with on a government to government basis.

In order to meet these goals, EPA has established a network of Indian Coordinators at the regional and national level. These coordinators enable EPA's regional and media offices to work directly with Indian tribes to offer the assistance tribes need. Activities of the Indian Work Group, located in the Office of Federal Activities at EPA, include working to amend EPA's environmental legislation to address tribal needs and administering grants to tribes for pollution assessment, control and prevention. In addition, the work group helps formulate and implement policies relating to environmental conditions in Indian country, generates pilot projects, and provides training and technical assistance to tribes.

### **Environmental Conditions in Indian Country\***

There are 281 federal Indian reservations in the United States, covering approximately 54 million acres, equal to the combined area of New England, New Jersey, and Maryland. Lands on which Native Americans hold treaty rights to hunt, fish, graze livestock or gather foodstuffs, comprise an additional 100-125 million acres (Bureau of Indian Affairs, 1988). No comprehensive survey has been conducted of environmental conditions on Indian lands as a whole. Various more limited surveys, however, suggest that Indian reservations experience

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\* Indian Country is defined by federal statute in 18 U.S.C. 1151 as all land within the limits of an Indian reservation, all dependent Indian communities within the borders of the United States, and all (individually held) Indian allotments.



a broad range of problems including surface and groundwater contamination, improper disposal of solid waste, human health risks stemming from uranium tailings and other hazardous wastes, and unsafe levels of air pollution (Americans for Indian Opportunity, 1986).

Environmental health problems are a concern on many reservations. Water quality was cited by many tribes as the leading concern in a 1986 Americans for Indian Opportunity (AIO) survey of environmental needs in Indian country. Of the 48 tribes responding, 65% depend solely upon groundwater for water supply; and 31% depend upon a combination of surface and groundwater. Tribes reported violations of EPA drinking water standards on 17 reservations, and outbreaks of waterborne disease on nine reservations. These problems are probably underreported because most individual water systems are not monitored.

Waste disposal information for Indian country is anecdotal, and no comprehensive national data are available. However, sewage and waste disposal were rated as major concerns in the 1986 AIO needs assessment. According to tribal reports, for example, 9,300 homes on Navajo lands and 10 percent of the homes on the Mississippi Choctaw reservation lack sanitation facilities. In 1990, the Indian Health Service identified 112,124 homes on Indian lands and Native Alaskan villages in need of piped indoor drinking water and 64,027 homes in need of sanitation facilities at a total cost of \$495 million (IHS, 1990).

Hazardous waste disposal is a growing concern to tribal governments. Nine of the sites on or proposed for the Superfund National Priorities List are on or near Indian lands: Commencement Bay, Washington; United Nuclear, New Mexico; Tar Creek, Oklahoma; Tucson Airport, Arizona; Celtor Chemical Works, California; Ft. Howard Paper Company, Wisconsin; General Motors Foundry, New York; Bunker Hill Idaho; and Prewitt Refinery, New Mexico (EPA, 1987; Topper, p.c. 1991). In addition, a 1985 Council of Energy Resource Tribes (CERT) survey of active and inactive hazardous waste generator, storage, and disposal sites, found that a minimum of 65 hazardous waste disposal sites were located on the 25 reservations surveyed (CERT, 1985). In 1987, 18 of these sites were listed in CERCLIS, EPA's inventory of potential hazardous waste sites to be assessed under Superfund (Senate Select Committee on Indian Affairs, 1989). The CERT study combines active and inactive

sites, the majority of which are probably not significant threats to human health. BIA has identified 24 additional potential hazardous waste sites needing investigation on reservations not included in the CERT study (CERT, 1989).

### **Risk Assessment and Comparative Risk Analysis**

Over the past twenty years, environmental policy in the U.S. has evolved largely in a piecemeal fashion in response to particular concerns. While this approach has successfully reduced the threats posed by many environmental contaminants, the increased diversity, complexity and scope of environmental problems the U.S. faces today demands a more integrated approach. In response to this challenge the EPA has identified environmental risk as a concept enabling environmental managers to discuss and compare disparate problems in common terms. By establishing a common measure, risk will help the agency to order environmental priorities and develop environmental protection strategies in a consistent and systematic way (Reilly, 1991).

Risk assessment is a method for establishing the health effects of suspected contaminants by linking the dosage of a particular substance with an expected response. Central to EPA's standard-setting process, risk assessment has been criticized for often relying on small or unrepresentative sample sizes, making extrapolations from animal studies to human impacts; and being unable to adequately predict long term health impacts. Moreover, the approach results in minute probabilities that are often poorly understood by the public.

Comparative risk analysis broadens the discussion of risk to try to address the various risks people encounter in their daily lives. While risk assessment is purely health based, comparative risk analysis aims to rank environmental hazards according to their health, ecological and economic impacts, in order to effectively utilize limited agency resources. Problems are ranked according to each of the health, ecological and economic criteria, but the rankings in these three categories are not combined to derive a single score. As a result, a particular hazard, such as airborne lead, may be ranked as having high health risks, but low

ecological risks (EPA/OPPE, 1989). Comparative risk analysis offers the advantages of addressing economic and ecological concerns as well as health risks, areas of critical concern that have often been neglected by EPA in the past. In addition, the comparative risk analysis process, which involves gathering data from numerous perspectives and analyzing and ranking them by expert consensus, offers the opportunity to build a more integrated and participatory approach to environmental management (EPA, 1990).

These characteristics make comparative risk analysis a promising tool for examining environmental risk in Indian country. However, the process remains limited by several of its basic assumptions. First, comparative risk analysis assumes risk at a single moment in time, rather than over a period of time. Given the long latency period of many environmental threats, and the dynamic nature of environmental processes, this assumption is an oversimplification of actual risk. In addition, comparative risk analysis uses the number of people affected as a central factor in weighing the importance of a given risk. This approach stems from the first recommendation of the Science Advisory Board's Reducing Risk, which states that "EPA should target its environmental protection efforts on the basis of opportunities for the greatest risk reduction (EPA, 1990)." As a result, comparative risk analysis consistently ranks the problems of low-density, rural areas -- such as Indian reservations -- as less important than those of densely populated urban areas, and overlooks the issue central to environmental equity: the distribution of environmental risk. Finally, because risk assessment focuses on health-based indicators, it is not a useful tool for examining the ecological impacts of environmental risk.

## CHAPTER 2. CHARACTERISTICS OF AMERICAN INDIAN POPULATIONS

### Population

According to the U.S. Census, there are two million American Indians in the United States today. Forty-five percent of them live on or near reservations and trust lands. American Indians are one of America's smallest minorities, comprising less than one percent of the U.S. population. Yet they are also among the fastest growing and most rural population groups in the country (HHS, 1984).

While population growth rates are high, outmigration rates, are relatively low for Indian tribes. Although an increasing number of American Indians are moving to urban areas, many return to their reservations for economic or personal reasons (see Thornton, 1987). If reservation populations continue to grow at current rates, pressure for development and the potential for environmental degradation will multiply.

### Health

Although death rates for American Indians have declined substantially over the past 30 years, when adjusted for age, they are still 12 percent higher than those for the white population (IHS, 1990). American Indians can expect to live three years less than whites, with expectancy for females exceeding that of males by seven years. For American Indians, the largest causes of excess deaths\* are accidental injuries, cirrhosis, homicide, suicide, pneumonia, and diabetes (HHS, 1984). Accident rates are more than double that of the general population, and chronic liver and cirrhosis rates are triple (IHS, 1990). By contrast, rates of heart disease and cancer -- diseases of middle and old age -- are relatively low. Based on these results, the

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\* the difference between expected deaths based on rates for the white population and observed deaths (in order of greatest contribution)

## Poverty

Poverty, unemployment, and underemployment are pervasive in Indian Country, and are worst for Indians living on reservations. In 1986, the Bureau of Indian Affairs Task Force on Economic Development found that the overall reservation unemployment rate was 58 percent, compared to a rate for the entire U.S. population of 18 percent, and for off-reservation Indians of 26 percent. Similarly, the percent of reservation American Indians living below the poverty level-- 41 percent -- was more than triple that for the general population (12 percent), and nearly double that of off-reservation Indians (22 percent) (BIA, 1986). Poverty is, of course, also reflected in reservation living conditions, such as access to clean water and sanitation discussed above. In addition, a 1980 survey found that over half of reservation Indian families live in substandard housing, the majority of which was beyond repair (Taylor, cited in Snipp, 1989).

## Economic Development

Economic development in Indian country usually revolves around land-based resources, whether they be commodities, fish and wildlife, or tourism. Agriculture -- either through direct production or leases to nonIndians -- is also a major source of income, particularly in the Plains states.

Fish and wildlife resources are major sources of revenue, particularly for tribes with hunting and fishing treaty rights. Tribes along the Great Lakes, the Colombia River, and Puget Sound have rights to commercial fisheries worth millions of dollars. Throughout the U.S., tribes have established recreational and hunting enterprises, selling hunting, fishing, and camping permits to nonIndian visitors. In 1986, 72 tribes had established public fishing programs, 61 tribes offered hunting programs, and 88 offered camping opportunities (BIA, 1988).

For about an eighth of all tribes, particularly those in the Western U.S., resource extraction industries such as mining, oil and gas development, and timber are major sources of income. In 1981, Indian tribes earned \$161 million in mineral revenues, and \$73 million in timber

revenues. Earnings from agricultural leases came to only one third the revenues from mineral development (BIA, 1986). Like other rural populations with natural resource based economies, Indian tribes are vulnerable to economic hardships due to fluctuating prices in recent years for agricultural products, oil, gas, minerals and timber. BIA studies have found that 85 percent of reservation Indians live in areas where natural resource development is not likely to become the mainstay of future economic development.

Commercial waste disposal is one alternative means of economic development being considered by many tribes -- more than 40 have been approached by developers. The environmental impacts of this alternative are potentially very significant, and underscore the need for establishing environmental regulatory structures within tribal governments.

### Subsistence Economies

Many Indian tribes depend directly upon natural resources for food and other subsistence products. For tribes, environmental degradation can cause significant economic and cultural damage, as well as having health and ecological impacts. Most American Indians depend on varying combinations of subsistence resources, wages, and public assistance for their income. Tribes in the Northwest and Great Lakes region continue to utilize subsistence resources, while tribes in the Great Plains and Southwest are less dependent. For nearly all tribes, subsistence activities have changed with the introduction of new technologies, such as highpowered rifles, fiberglass boats, and snowmachines.

Despite the vast social and technological changes of the past four centuries, and the diminished economic role of subsistence activities for many tribes, subsistence retains extremely important symbolic, social, and cultural, as well as economic value. Observers and participants have noted that subsistence activities foster a sense of closeness to nature, self-reliance, and independence, as well as cementing social and cultural ties through harvesting and sharing of resources (Muth and Glass, 1988).

## **Social Characteristics**

When discussing American Indians and the environment, it is important to note that there are two distinctly different populations: the 45% of Indians who live on reservations and in other rural settings, and the 55% who live in more urban environments. Indians living in urban areas tend to have higher educational levels, and lower fertility than those living in rural areas. Urban Indians are exposed to many of the same environmental pollutants as other urban minorities. Reservation Indians practice more traditional ways of Indian life and while they may not be exposed to pollution in the same way or degree as their urban counterparts, they are at risk of severe cultural and social disruption if pollution makes culturally significant portions of their tribal homelands uninhabitable.

Due to historical disadvantages, poverty, and isolation, American Indians lag behind the national average in educational attainment. While 66.5 percent of Americans have graduated from high school, only 55.4 percent of Indians have done so. At higher educational levels, the disparity is more striking: 7.4 percent of American Indians have graduated from college, only half the national average (IHS, 1990). While American Indian tribes have made great strides in higher and professional education, many remain unable to fill their professional management needs with tribal members (Thornton, 1987).

## **Risk Perception and World View**

In their classic theory of risk perception, Douglas and Wildavsky argue that while risks are real, no perception of risk is completely objective, and all perception of risk is culturally influenced (Douglas and Wildavsky, 1982). Many empirical studies have supported the hypothesis that major differences in risk perception exist among individuals and groups. While the differences between experts and nonexperts have been most extensively documented, differences between racial and ethnic groups have also been noted (Vaughn and Nordenstam, 1991). Risk perception has been shown to be influenced by prior experiences and world views, suggesting that individuals who share similar life experiences, attitudes and values are more likely to share similar evaluations of risk.

The cultural theory described by Douglas and Wildavsky suggests that Native American attitudes toward risk would be strongly influenced by their experience. For all tribes, this experience has been one of loss of sovereignty and cultural autonomy. Traditionally, Native Americans viewed themselves as part of the natural world, living in harmony with their surroundings. As Ward Churchill (1986), a Creek/Cherokee leader, puts it:

Unlike Europeans, Native Americans long ago achieved a profound intellectual apprehension that human progress must be measured as an integral aspect of the natural order, rather than as something apart from and superior to it. Within this structure, elaborated and perfected through oral tradition and codified as "law" in ceremonial and ritual forms, the indigenous peoples of this hemisphere lived comfortably and in harmony with the environment, the health of which they recognized as an absolute requirement for their continuing existence.

This emphasis on harmony and stability gave rise to many religious practices and social conventions governing an individual's relationship to nature. Despite the enormous physical and social dislocations of the past two centuries, many tribes still adhere to their traditional beliefs and practices concerning the environment.

American Indian tribes are extraordinarily diverse, and no single statement could sum up the differing attitudes toward environmental risk. However, many anthropologists have noted the differences between Indian and European attitudes toward nature. Stated broadly, Indians traditionally view nature as an integrated, animate whole, while the European tradition (and the mainstream American society which stems from it) views nature as an inanimate source of resources for human use (Vecsey and Venables, 1980).

Wildavsky and Dake (1990) note that while scientists and experts weigh risk quantitatively, the qualitative aspects of risk carry more weight with laypeople. This observation is clearly borne out by the experiences of Indian tribes with energy development. A 1979 Study of Navajo Perceptions of the impact of Environmental Changes Relating to Energy Resource Development found that:

Shiprock residents feared loss of economic and emotional support of their extended family and kinship groups; loss of livestock and land; loss of self-sufficiency and security made possible by keeping livestock; and loss of activities that support the inculcation of values such as sharing and mutual support in the extended family (Robbins, 1984).



Despite these strong feelings, such considerations are rarely captured in the cultural and social impact assessments that accompany development.

The experience of the three bands of Utes, who are currently developing their oil and gas resources reveal something of Indian attitudes toward risk. The Utes are reluctantly permitting the development of their oil and gas resources out of a need for income, and a conviction that these resources will be appropriated by outsiders if they are not used. This latter assumption is based on over a century of losing battles with the federal, state and local governments over land ownership and water rights. As a result, although the Utes tend to be risk averse, they feel they have no choice but to permit development. However, because the tribe lacks members with sufficient technical expertise to evaluate development proposals, its power is currently limited to saying "yes" or "no" (Romeo, 1985). As many risk perception studies have noted, control over risks is an important component of their acceptability to a community (see Appendix).

According to traditional Ute belief, nature is a source of power that can be acquired by shamans to benefit the community. Yet because secrecy is required in many sacred matters, the importance of the natural world to the Utes is poorly understood by nonIndians. Utes not only value sacred sites and burial grounds, but are deeply disturbed by threats to local plant and animal species, erosion, water pollution, and other forms of environmental degradation. One member of the Ute Business Committee (in charge of overseeing oil and gas development) commented that "taking oil out of the ground is like taking blood from the veins of a persons body." Another tribal member expressed more general concerns: "You must maintain the place -- your place, where you live, and where the family has always been. The land, the water, the game are sacred. You must always have it, forever. Not tear it up." Given these beliefs, many Utes are deeply divided about oil development, and express strong concerns about environmental and cultural impacts on future generations (Romeo, 1985)

Similar divisions have been expressed by tribes considering waste disposal facilities, and other income generating activities with potentially serious environmental impacts. These mixed feelings have often led to splits within tribes on controversial development projects (SCLDF,

1984). These disputes vividly illustrate that struggles for control over which risks to take may divide tribes as well as individuals.

The case of development of Ute lands reveals the commonly expressed fear of loss of control and sovereignty over the land and its resources. This fear of loss -- grounded in centuries of experience -- may take many forms. In Arizona, the Paiute tribal government, deeply in debt to the Internal Revenue Service, supported the development of a hazardous waste facility on trust lands partly out the the fear that the Bureau of Indian Affairs would take control of tribal government if it was unable to discharge its debts. In this case, the environmental risks stemming from the incineration of hazardous wastes were judged to be less of a threat than the perceived threat of federal action (Austin, p.c. 1991).

### CHAPTER 3: IMPLICATIONS FOR RISK ANALYSIS

The unique characteristics of rural American Indians expose them to different types of environmental risks than those experienced by urban Americans whose risk, because of their large and concentrated populations, dominate national and regional risk comparisons. New methodologies must be developed to identify and quantify, where appropriate, the risks experienced by smaller, rural populations. In many ways, the risks experienced by Indians are shared by rural dwellers throughout the country: groundwater contamination, pesticide exposure, and nonpoint source pollution, to name a few. In other cases, American Indians are additionally affected because of cultural or social characteristics, such as diet, subsistence lifestyle, or poverty. In particular, American Indians face health risks from cultural practices or lack of infrastructure; economic risks to their land-based economies; risks stemming from the lack of environmental infrastructure; and future risks based on high population growth rates on a limited land base.

#### Health Risks

There are many problems in assessing environmental health risks for American Indians: small sample sizes, unknown genetic factors, and numerous confounding effects that make it difficult to show cause-effect relationships. These problems impede risk assessment under the best of circumstances, but are often compounded when looking at American Indian tribes. Among many American Indians, high rates of alcohol abuse, diabetes, obesity and other health problems must be distinguished from sources of morbidity and mortality caused by environmental conditions or contamination. Medical researchers have noted that Native Americans, as compared to whites, have significantly lower rates for cancer of the lung, breast and colon, and higher rates for the gallbladder, kidney, and cervix, but that the relative contributions of heredity and environmental factors are difficult to assess (Sievers and Fisher, 1983). In addition, the cultural and genetic heterogeneity of Indian tribes usually makes extrapolations to Indians in general inappropriate.

One environmental pathway that particularly affects many Native Americans is the bioaccumulation of pesticides and other chemicals in animal (particularly fish) tissue. Native Americans are vulnerable for two reasons. First, some Indian tribes -- particularly those in the Pacific Northwest and Great Lakes states -- eat much more fish than the average American, thereby consuming more contaminants. In addition, because of cultural practices, many Indian tribes traditionally consume the entire fish, including fatty tissues where chemicals are most concentrated. These differences have important policy implications. While EPA bases its estimates of exposure to dioxin-contaminated fish on average consumption rates of 6.5 grams/day, Native Americans who rely on fish for subsistence may consume more than five to ten times that amount (West, et al, 1990; EPA, Aug 1990).

These differences could have significant health implications. A 1986 study on pregnant women in Western Michigan showed that women eating approximately twelve fish meals during their entire pregnancy had babies with significantly lower birth weights than non fish-eating mothers. More importantly, a follow-up study in 1990 found that these same children at age three had significantly reduced attention spans, an indicator of probable future learning disabilities (Jacobson, et al, 1990). These data highlight the importance of integrating health research with sociological and anthropological approaches to ensure that differences between groups exposed to environmental contaminants are understood, and that fish advisories and contaminant standards are set at appropriate levels.

In addition to cultural differences, poverty itself is a factor in diminished health status. While there are no data showing mortality rates by race and socioeconomic class, the few studies available suggest a link between health and poverty. For example, in a 1986 survey, individuals making \$10,000 or less a year reported significant health problems 4 to 6 times more often than those making over \$35,000 (HHS, 1988). While most such studies have focused on the health differences between blacks and whites, those controlled for race indicate that poverty is an important and often overlooked factor in the ethnology of increased morbidity and mortality.

## **Risks to a Land-Based Economy**

### **Roots in the Land**

American Indians living on reservations are land-based people, and the reservation remains the focal point of cultural life for many urban Indians. These strong ties to their homelands distinguish American Indians from the mobile, less-rooted majority of Americans. As a result, the assumptions on which EPA bases its assessment of economic risks, based on the "typical" (and therefore urban) American, may not be valid for American Indians. Certain types of environmental damage, such as wildlife habitat loss or degradation, are likely to have a much greater economic, psychological, and cultural impact on the welfare of Native Americans than on the general population.

In addition to being a land-based people, Indians are linked to a particular parcel of land through the historical evolution of the reservation system. While most Americans have become increasingly mobile over the past few decades, the Indians who live on reservations have either chosen to remain within their community, or are too poor or culturally isolated to move elsewhere.

The impacts of forced relocations of American Indians in the 19th and 20th centuries illustrate the cultural and economic impacts of being uprooted from their way of life. This uprooting took place both directly, through warfare and forced resettlement, and indirectly, through the loss of natural resources needed for subsistence, such as the buffalo. While the former threat has largely subsided, the latter remains a serious concern. Bound to the land by history and culture, reservation Indians have been forced to either move away from the reservation or change from their traditional methods of subsistence natural resource utilization due to ecological degradation resulting from development and population growth. As such they risk losing both culture and community.

The tragic story of Grassy Narrows, Ontario is an example of the impacts of dislocation and environmental degradation on Native Americans. In 1963, the Department of Indian Affairs decided to relocate the people of Grassy Narrows to a new village five miles from the old settlement in order to improve accessibility to social services. Seven years later, while the

people were struggling to readjust and to put down new roots, the government discovered that the river which had formed the focal point of village life was poisoned by methyl mercury released by a nearby paper company. This contamination compounded the social impacts of the village relocation by removing the river and its resources from tribal use.

Over the next decade, in the words of an observer who lived in the village for over two years, the village became "a case study in the causes and symptoms of social disintegration." Alcohol and substance abuse rose dramatically, and child abuse and other symptoms of family stress became increasingly common. To list one statistic among many, "between 1959-63, 91 percent of all deaths in the community were due to natural causes. By the mid 1970s, only 23 percent of deaths could be traced to old age, illness, or accident" (Shkilnyk, 1985).

Today, with the economic importance of traditional subsistence practices declining among most American Indian tribes, the cultural importance of the reservations as centers of tribal identity has become primary. If reservations become unliveable, many Indians feel they will literally have no place to go. As one Navajo woman put it:

Some of the white people came to my house and they asked me how I felt about selling out and moving away... I told them I wasn't interested in selling. I told them that it is the same with us as it is when you have an old tree, and it is in your way. If there is a beautiful old tree, and you dig it up and move it, do you think it will continue to live? Even if you do everything you can to prepare new ground for it, do you think that tree will live? No, it won't live (Nelkin, 1981).

Similarly, during the recent debate over tribal management of a hazardous waste landfill, Mississippi Choctaw Odie Jim commented:

What if something happens to the landfill, like a leak and damage and the tribe is sued and we lose the land? We, the old ones and the elderlies have to do the right thing for the young ones. If they sue us and we have no money, they will take the whole reservation and the young ones will have nothing (Smothers, 1991).

In Oklahoma, where activists argue that livestock deaths, birth defects, and mutated animals can be traced to the Sequoyia Fuels nuclear reprocessing plant, Indians suffering radiation health effects from the have refused to move out of the contaminated area which is their home. The plant was finally shut down in 1991 (CCHW, 1991; Austin, p.c., 1991).

### Valuable Ecosystems

If well managed, the rural landscape of Indian Country has enormous value for both Indians and nonIndians. First, much of Indian Country is still shielded from the some of the impacts of urbanization and industrialization and provides valuable wildlife habitat and recreational opportunities. Over 80 Indian reservations support threatened or endangered species, including the bald eagle, peregrine falcon, and Florida panther (BIA, 1988). As urbanization and its impacts spread, Indian reservations have become important reservoirs of biological diversity. With proper environmental management, these lands could play an increasingly important role in wildland protection. In the Pacific Northwest, 20 member tribes of the Northwest Indian Fisheries Commission are involved in a project to reduce nonpoint source pollution in order to protect marine life. In addition, the Swinomish tribe is taking steps to protect salmon and steelhead habitat from degradation (Topper, p.c., 1991).

Similarly, Indian lands, with the exception of the Navajo reservation, are not significant producers of air pollution. These nonindustrialized areas "produce" health and environmental benefits in the form of clean air. In addition, the large tracts of forested areas remaining on many Indian lands in the Western U.S., though small in comparison with other federal lands, act as a carbon sink to help ameliorate the impacts of global warming.

### **Risks from Lack of Environmental Infrastructure**

As noted earlier, environmental protection in Indian country lags behind that in other areas. During most of the 20th century, tribes were powerless at the national level, lacking the resources and training to develop governmental entities capable of making technical decisions. While environmental issues gained national importance in the 1960s, and led to the creation of the EPA in 1971, tribes were largely forgotten in the first decade of environmental law and regulation. EPA began establishing partnerships with the states to ensure environmental protection in the early 1970s, but did not adopt its first Indian policy until ten years later. Major environmental laws, such as CERCLA, the Safe Drinking Water Act, and the Clean Water Act were amended to address tribal needs only in the mid-1980s. As a result, tribes

have not received the attention and financial assistance that have enabled states to establish and operate environmental protection programs. At the same time, pressure for economic development on Indian lands is growing as developers seek out the undeveloped, often resource rich lands, and tribes seek ways of increasing employment and tribal income to support rapidly growing populations.

At the community level, most Indian tribes have high unemployment rates and little or no tax base due to the lack of economic opportunities on reservations. Consequently, tribes are unable to fund extensive health and environmental services to their members. Tribal services such as waste pickup or water quality monitoring may be unaffordable, and tribal members must rely on limited services provided by the Indian Health Service. In 1986, solid waste disposal was cited as a problem by 75% of the tribes responding to a survey by Americans for Indian Opportunity. On many Indian lands, landfills are located many miles from most residents, and collection services are limited by severe financial constraints. As in many rural areas, user fees do not cover the costs of waste collection, which must be financed by local authorities. As a result of problems like these, illegal dumping is common in Indian country (AIO, 1986). In addition, tribes find illegal dumping by outside residents and corporations difficult to control.

In addition to lack of funds, tribal governments often lack staff trained in the environmental sciences and capable of making technical judgements. This lack of expertise increases tribal risk from often unscrupulous outsiders seeking to take advantage of the reservations' remoteness, exemption from state laws, high unemployment and need for economic development. Within the past few years, over forty tribes have been approached by solid and hazardous waste companies seeking to site disposal facilities on tribal lands, which are not covered by state regulations (Topper, p.c. 1991). In South Dakota, for example, the Rosebud Sioux were approached with a proposal -- ultimately rejected -- to develop a 5760 acre solid waste landfill on the reservation capable of serving an area from the Colorado Rockies to the Mississippi River (Miniclier, 1991). The project was initially approved by the tribal government, which argued that the jobs and \$2 million annual revenues were badly needed on



the reservation, where unemployment rates exceed 65 percent. After much debate and grassroots opposition, however, several members of the tribal council reversed their stands and the project was rejected (Schneider, 1991). In October 1991, the Mescalero Apache tribe in New Mexico applied for a Department of Energy study grant to conduct a feasibility study for storing nuclear waste on the reservation (Lippman, 10/21/91).

While only a few solid or hazardous waste disposal projects are going forward, tribal governments are often forced to make decisions about environmentally risky projects without adequate information or expert advice. Tribes desperate to provide employment opportunities may also consider projects that would be rejected out-of-hand by wealthier communities.

Tribes also face environmental risks from local, Indian-owned enterprises, which are often ignorant of the environmental hazards they are creating. On the Navajo reservation, for example, a private company making electrical components for automobiles, owned by tribal and nontribal members, dumped hazardous wastes in a local solid waste landfill near Leupp, Arizona, unaware that it required special treatment. In another case on the Soboba Reservation in California, a tribal member set up a business to reclaim contaminated soil from leaking underground storage tanks by a land application process. Rains then washed the oil-contaminated soil into nearby streams and creeks (Topper, p.c., 1991).

Finally, tribes without environmental expertise may lack the information to make sound environmental choices about acquiring and managing lands. In Bad River, Wisconsin, the tribal government accepted the gift of a privately owned site on the reservation that had been used by a paper and pulp company as a landfill. The site, which was covered and seeded, is now seeping methane, and is unusable for building. Moreover, the tribe is now responsible for taking steps to vent the site, and to ensure that it poses no serious hazards. In New Mexico, the Navajo tribe bought lands owned by a local oil refinery in order to acquire the rights to use the aquifer underneath, and acquired a Superfund site as well (Topper, p.c., 1991).

Despite recognition of the importance of environmental management, tribes face serious dilemmas in deciding whether to apply for treatment as a state under the various federal laws.

For small tribes with limited resources, environmental management means diverting funds from other essential programs. Economies of scale argue against extensive environmental programs for small tribes. Yet without such programs, tribes face continuing dependence on federal agencies, increased risk of environmental degradation, and an uncertain regulatory environment which may discourage outside investment (Govin, 1987).

### **Future Risks**

As noted earlier, the concept of environmental risk usually assesses risk for a particular moment in time. This "snapshot" approach allows comparisons of a particular risk to different individuals or groups, but does not express cumulative risk. While this weakness of the methodology applies to all population groups, it is particularly problematic for American Indians. First, as noted above, American Indians have strong cultural and historical ties to their lands. Nearly one half of the American Indian population live on or near reservations, and many urban Indians eventually return to settle in Indian country. For many, being Indian means living, or having the option of living, on the reservation. Secondly, American Indian religions see life as a circle encompassing all living things: past, present and future. The Iroquois statement that leaders should consider the impact of any action of the seventh generation illustrates the importance of future generations, not as an abstract principle, but as a guide to everyday action.

### **Population Trends**

The history of the American Indian population trends illustrates the devastating impact of European settlement on native peoples. While the population of North America before Columbus is much disputed, many historians estimate that there were between two and five million inhabitants of the continent (not including Mexico) in 1492, and some suggest the figure could be as high as 18 million (Snipp, 1989). During the first century of contact with Europeans, tribal populations were decimated by exposure to Old World diseases to which they had no resistance. These highly infectious diseases included smallpox, diphtheria, cholera,

influenza, typhoid, measles, and scarlet fever. Populations continued to decline due to disease, displacement, and warfare for the next 300 years.

The American Indian population reached its nadir between 1890 and 1900, when there were an estimated 250,000 Indians (Thornton, 1987). Since then, it has climbed steadily, reaching nearly two million by 1990. Today, American Indians have among the highest population growth rates in the U.S. In 1980, the American Indian birthrate for reservation states was 26.7 per 1,000, nearly double that of the general population (Thornton, 1987). Moreover, American Indian women living on or near reservations had more children on average (3.2) than their urban counterparts (2.59) (US Census, cited in Snipp, 1989). While the reasons for these high birth rates are debated, their impact has been unmistakable. American Indian populations more than doubled between 1970 and 1990, and grew by 43.4 percent between 1980 and 1990, compared to a growth of 9.8 percent for the total U.S. population (US Census Bureau, 1991).\*

#### Population Projections

The American Indian population is young, with a median age of 23.4, compared to 31.3 for the total U.S. population (Snipp, 1989). For Indians, 32 percent of the population is younger than 15, and only 5 percent is older than 65. By contrast, the corresponding figures for the total U.S. population are 23 percent and 11 percent (IHS, 1990). This difference in age structure means that more Indian women are in or entering their childbearing years than the general population, and that American Indian fertility will remain higher as a result.

Differing estimates of future fertility have created a wide range of population projections. Yet all are based on two factors suggesting rapid growth: current high fertility rates and a young age structure. Based on current population trends, the U.S. Office of Technology

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\* An uncertain proportion of this growth is due to changes in ethnic identity, that is, increasing numbers of people identifying themselves as American Indian. For the 1980 Census, tribal governments, Indian organizations, and the Census Bureau made unprecedented efforts to encourage American Indians to identify themselves as such. This is no doubt partly responsible for the 72.4 percent "increase" in population over 1970 (Snipp, 1989). The same phenomenon contributed to the growth of the American Indian population between 1980 and 1990.

Assessment has predicted that the populations of Indians residing within reservation states will increase to 2.21 million by the year 2000, and to 3.7 million by 2020 (OTA, 1986). These figures -- like U.S. Census data -- include all people who self-identify themselves as American Indians.

How will this enormous growth in American Indian populations affect the reservations and trust lands? Some growth will be absorbed by migration to urban areas. Between 1940 and 1980, the American Indian population shifted from one that was 92.8 percent rural, to one that was 49 percent rural. (Over the same period, the overall rural U.S. population shrank from 43.5 to 26.3 percent [U.S. Census, 1991]). As a result of this trend, the proportion of Native Americans living on reservations and trust lands has slowly declined, from 25.2 percent in 1980, to 22.3 percent in 1990.

Although the relative proportion of Indians living on reservations and trust lands has shrunk, in absolute terms, reservation populations continue to grow. The total number of Indians living on reservations and trust lands grew by 18 percent between 1980 and 1990, from 370,101 to 436,909 (U.S. Census, 1990). The rapid population growth of the Navajo tribe -- the largest in the U.S. -- over the past forty years provides one model of the impacts of rapid population growth. The Navajo population grew from approximately 65,000 in 1950 to over 175,000 in 1985, an increase of 170 percent (Thornton, 1987). One of the impacts of this rapid growth has been a corresponding growth in the number of grazing animals, resulting in widespread rangeland degradation (Stoffle, 1987).

Future reservation populations can be estimated from the Office of Technology Assessment predictions. If 2.21 million Indians will reside in reservation states in 2000, based on current population distribution patterns, about half -- 1.1 million people -- will reside on or near reservations. By the year 2020, if the same assumptions hold, 1.75 million Indians will live on or near reservations. In addition to the pressure these numbers will place on the resource base, the age structure of Indian tribes will create a high dependency ratio, with more very young and old depending upon each tribal member of working age. This dependency will create additional pressure for economic development on reservations.

## Risks from NonIndian Lands

Boundary effects between Indian and nonIndian lands -- such as air pollution, downstream effects, and groundwater contamination -- require coordination between tribal and state or local officials that is often lacking. Such problems usually stem from economic activities such as mining and logging, and illustrate the component of environmental risk analysis that must be *prospective* in order to assess the impacts of development. Tribes in the Northwest, for example, have expressed concerns about state and federal activities affecting fish populations and water quality in the region. This year, the Shoshone-Bannock tribe set the endangered species review process in motion by petitioning the US Fish and Wildlife Service to consider listing the Pacific salmon. In one generation, the fish have dwindled from the thousands to numbers too small for the tribes annual religious ceremony (Egan, 1991).

The Shoshone-Bannock were also involved in a more dramatic confrontation, over environmental risk when tribal police refused to allow a truck carrying spent nuclear fuel to drive across the reservation to the Idaho National Engineering Laboratory. Although a Federal District judge ordered the tribe to let the truck through, the incident illustrates the ways in which tribes are seeking to establish control over the risk permitted within their boundaries (Schneider, 10/17/91). In turn, nonIndians located near reservations considering the establishment of commercial waste disposal facilities on tribal lands have expressed strong opposition, based on the potential environmental impact.

The protection of sacred sites located off of tribal lands is a unique problem within the context of risk analysis. In such cases, tribes face major threats to spiritually and culturally important sites that they are often powerless to control. Many tribes have lost important spiritual and cultural sites to development projects, including the Cherokee, who fought the flooding of burial sites by the Tellico Dam, and the Yorok, Karok and Tolowa Indians of California, who opposed the construction of a U.S. Forest Service Road through religious sites (Lyng v. NW Cemetery Protective Association, 1988). In 1990, several shrines sacred to the Hopi were destroyed when a privately owned butte 50 miles from the reservation was

leased for gravel mining. The mining incident, which commenced before a state-required environmental impact statement was completed, suggests the inadequate implementation of current cultural preservation policies, as well as the relatively trivial ends for which sacred sites are often lost (NYT 1/3/91). Current disputes include the Havasupai effort to prevent the uranium mining of their sacred mountain, Red Butte, and the Southern Paiute and Western Shoshone opposition to the proposed use of Yucca Mountain, Nevada as a high level nuclear storage facility.

In 1968, then-Secretary of the Interior Stuart Udall testified in favor of the Taos Pueblo Indians who were seeking the return of holy land including Blue Lake, an area sought by the state for tourism development and timber. Udall noted the cultural gulf between Indians and nonIndians on the subject of religion.

Because of the essential secrecy of its religion, it has been difficult for the Pueblo to explain in terms satisfactory to the American mind why it must own and control the entire watershed of the Rio Pueblo... [but] to insist that the Indians disclose more is to ask them to defame their holy mysteries ... It would be a tragic misunderstanding of the Indian's religious use of the area as involving only occasional use of a few sacred precincts (quoted in Cahn, 1969).

Similar misunderstandings continue to present a challenge to addressing Indian religious concerns through the EIS process.

Prospective environmental risk -- risk that is being considered, but has not yet been assumed -- can be managed through the environmental impact assessment process mandated by the National Environmental Policy Act (NEPA) and NEPA-like state laws. Yet this process has often proven subject to political constraints in the past, with the result that Native American concerns are often dismissed (Geisler, et al, 1982). In 1978, for example, the EIS prepared by the Nuclear Regulatory Commission for the uranium mining of White Mesa in Southeast Utah failed in 170 pages to mention the Ute reservation three miles away; nonetheless it was approved (Jorgensen, 1984). Since then, the EIS process has become more inclusive, and tribes have become more sophisticated in making their concerns heard. If tribes are given the opportunity to participate meaningfully, the EIS process can be an appropriate means to minimize prospective cultural, economic, and environmental risks in Indian country.

## CHAPTER 4. CONCLUSION

Diverse as the hundreds of American Indian tribes are, they share characteristics that distinguish them from the U.S. population at large. These characteristics -- based on unique cultural and historical experiences -- give American Indians a distinctly different pattern of exposure to environmental risk.

First, American Indians tribes are tied to a particular parcel of land, both culturally and economically. This land is the center of tribal identity, and is critical for political, cultural and economic survival. As a result, the potential impacts of environmental degradation or disaster are enormous.

Second, most Indian tribes lack an adequate environmental infrastructure on which to base sound environmental management decisions. Over the past twenty years, while the EPA established partnerships with the states, tribes were underserved due to legal uncertainties and political powerlessness. While EPA's Indian Policy has established the necessary framework for creating a strong tribal-EPA partnerships, tribes still often lack the infrastructure, resources and expertise to sustainably manage their lands.

This vulnerability is all the more critical when the risk profile for American Indians is extended out into the future. Tribes are among the fastest growing populations groups in the U.S., a trend that will place additional pressures on limited reservation resources. Already, tribes face endemic poverty and severe unemployment, and are investigating a variety of options to increase employment and income on reservations. All of these options -- from oil and gas development, to tourism, to waste disposal -- will have environmental impacts that will require planning and management. As the pressure to pursue these development paths increases, will tribes have the resources to address the problems they bring? Unless EPA makes significant changes, the answer to this question will be "no."

## Recommendations

In its Indian Policy Statement, EPA identified the strategy for meeting these challenges: building tribal capacity for environmental management. How can this goal be met? Significant steps toward it are already being taken. Since 1984, nearly all the major environmental laws have been amended to allow tribes to apply for treatment as a state, and to assume responsibility for the implementation of environmental regulatory programs. The agency has provided media specific grants, technical assistance, and training. Yet more progress is needed. The two recommendations described below point to actions that can be taken at the national level to support the efforts of tribal governments to reduce environmental risk.

Provide additional resources. As noted earlier, federal environmental partnerships with the states were established with the birth of EPA in 1971, while EPA's Indian Policy, laying the foundation for a similar partnership with tribes, was not articulated until 1984. As a result, tribes have not received the resources that have enabled states to establish environmental infrastructures. Between fiscal years 1985 and 1990, EPA granted a total of \$25.9 million in direct assistance to all Indian tribes. By contrast, three states comparable in geographic area and population to the total of all Indian reservations -- Idaho, North Dakota, and South Dakota -- received three to four times that amount. Most of this disparity can be accounted for by construction grants for wastewater treatment (approximately three-fourths of the funding received by the three states), which are granted on a population weighted basis that favor cities over rural areas. However, when these grants are subtracted, the three states still received an average of 50 percent more than the tribes over this five year period. For earlier periods, of course, tribes received far less federal environmental funding.

Recently, in response to the historical inequity of funding for Indian programs and the increasing evidence of environmental problems in Indian country, EPA began a multi-media grant program to enable tribes to complete environmental assessments of their reservation environments, to target critical environmental problems, and to enhance their environmental management programs. Support for this program, which is intended to run for several years,



is critical for helping to raise tribal environmental infrastructure toward the level attained by the states.

Modify the risk analysis process. Many of the conceptual issues raised here are not addressed in EPA's comparative risk process for three major reasons. First, comparative risk aims to evaluate a "snapshot" of environmental risks at a particular time, rather than examining risk over a period of time, or the historical reasons for such conditions. A broader perspective on the factors that put an individual or group at risk is needed.

Secondly, EPA's risk assessment process relies upon population exposure as a major factor in ranking risks, resulting in a bias against rural areas with low population density, such as Indian reservations. While the size of the affected population is undeniably important, it is a crude tool best supplemented by more detailed analysis. Uranium mining, for example, is a tiny threat to the well being of most Americans, but a significant environmental problem in Indian country. If environmental equity concerns are to be met, the breadth of environmental impacts must be weighed against their severity so that the variable distribution of environmental impacts can be assessed.

Finally, in its current form, comparative risk is heavily dependent upon health and economic assumptions, and does not address cultural considerations such as diet, subsistence lifestyle, or the religious view many tribes have of the natural environment. Methodologies must be developed to account for the differences between culturally unique groups and the population at large.

A final obstacle to the application of comparative risk analysis on Indian lands may be tribal resistance to the Western approach of prioritizing problems. Stoffle and Evans (1990) have documented the tension between a holistic approach to conservation with what they term "cultural triage" in preserving sacred off-reservation lands. Indians, seeing their environments as an integrated whole, are often reluctant to argue that one part is less essential than another. As the Owens Valley Paiute Tribal Chair commented during a meeting on the proposed high-level radioactive waste facility at Yucca Mountain, NV:

Indian people say, "What's more important; the earth that we stand on, the air that we breath, or the water that we drink?" They all have their reason to be here and that is what we have to get over to the United States Supreme Court. We are nothing, but to put it all together it forms a circle. And we all have to live together no matter what, because it's our earth. These things are here, we didn't put them here, so who are we to move them. We didn't create them, but we are here to protect them (Stoffle and Evans, 1990).

If comparative risk is to be promoted as a planning tool in Indian country, tribes may need to adapt both the framework and the process to reflect their perspective on environmental protection.

Despite these problems, the participatory nature of comparative risk analysis offers a promising new approach toward environmental management. By explicitly involving tribal members in discussions about risk, comparative risk analysis may offer a means to integrate traditional, consensus-based decision making with urgently needed decisions regarding tribal environmental principles, practices and procedures. Such consensus is critical if disputes over future development projects are to be effectively resolved.

### **EPA's Role in Building Tribal Environmental Management Capacity**

The recommendations described above meet a variety of Agency interests and obligations. First, like every federal agency, the EPA has an obligation to act as a trustee in its relationship with Indian tribes. This legal and moral obligation, conferred upon the government through a series of treaties and agreements, requires the agency to act in the tribes' best interest in sustainably managing their lands for future generations. Although the concept of trusteeship has been attacked as paternalistic by many, including Native American activists, its intent can be read as ultimately achieving the opposite. If the "best interest" of each tribe can be determined only by that tribe, then capacity building is the truest fulfillment of the federal trust responsibility.

Of course, EPA's self interest would also be served by strong environmental management at the tribal level. Just as strong enforcement and environmental planning at the state level have enabled the Agency to address an increasing range of environmental issues, strong tribal

environmental agencies will ease the agency's enforcement burden. On the contrary, if tribes are unable to develop their environmental infrastructure to manage development in Indian country, future enforcement problems will multiply. Moreover, enforcement actions in Indian country are particularly problematic. Ironically, fines simply divert funds from tribal coffers -- where they are desperately needed -- to federal ones, where they can no longer be used for tribal environmental protection. As a result, tribes are punished for inadequate environmental protection by reducing their ability to protect their environments.

Finally, enhancing environmental protection in Indian country serves to correct a historic imbalance. Tribes, like states, are sovereign entities, responsible for the health and well being of their members. Yet through the past two decades of environmental protection, tribes have been denied a fair share of the available resources, and have been unable to adequately protect their environments as a result. EPA's commitment to building tribal capacity for environmental management is a major step toward a more equitable and sustainable environmental future.

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