AMERICAN INDIAN CULTURE AND RESEARCH JOURNAL 26:2 (2002) 63–114

Cartographic Review of Indian Land Tenure and Territoriality: A Schematic Approach

IMRE SUTTON

A BRIEF REVIEW OF THE CARTOGRAPHIC RECORD

There is no dearth of maps depicting Indian lands. The cartographic resource of original, modified, or reconstructed maps is voluminous and map sources abound in the official record and in the literature.[1] To be sure, the vast majority of published maps derive much of their subject matter from older, more empirical sources. Yet gaps exist in the mapping record. Some tribal areas were never mapped (or were poorly mapped) and many maps of such areas have been lost.[2] Keeping up with the countless boundary changes that have affected any one tribe's ultimate territory (reservation) under federal administration is not impossible, but is frustrating nonetheless. In many instances treaties of land cession have suffered from poor translation into maps, and treaty wordings referring to tribal territory have been called into question.[3] To date, no one has sorted out, classified, and indexed the countless maps that represent background data and exhibits in claims litigation before the Indian Claims Commission (ICC) or the Federal Claims Court (formerly the Court of Claims).[4] Moreover, rarely can only one map fully display the numerous changes in Indian land tenure and territoriality from aboriginal times to the present that would relate to any specific tribe or reservation.[5]

Selective Official Compilations

It is not my intention to make an exhaustive review of any aggregate grouping of map sources. Yet a few words about certain government documents may

Imre Sutton is professor emeritus of geography at California State University, Fullerton. He is the editor of *Irredeemable America: The Indians' Estate and Land Claims* (1985) and three previous symposia in the *American Indian Culture and Research Journal*, 12:2 (1988), 15:2 (1991), and 24:1 (2000). He is coeditor (with Richmond L. Clow) of *Trusteeship in Change: Toward Tribal Autonomy in Resource Management* (2001).

prove instructive. At times, individual government reports and congressional hearings include useful maps. Of more compendious documents there is C. C. Royce's *Indian Land Cessions in the United States*. Although more detailed discussion will be made later of this volume of sixty-seven multicolored plates, note that it remains the standard atlas in the cartographic and legal history of Indian lands. The Royce volume includes detailed entries of events, laws, executive orders, and other data from 1784 to the late 1890s, and these are indexed to numbered map areas—so-called Royce numbers as utilized in land claims litigation—making the volume significantly resourceful.

A number of other documents have appeared from time to time. In 1953 the government published a *Report with respect to the House Resolution Authorizing the Committee on Interior and Insular Affairs to Conduct an Investigation of the Bureau of Indian Affairs*, which is a very different yet equally compendious volume of data—statistical, historical, and cartographic—prepared in conjunction with an investigation of the Bureau of Indian Affairs (BIA). This document includes two sets of maps: the first consists of seventy-five plates comprising comparisons of existing reservations and original range; the second is made up of existing reservation maps (plates 76–157). The seventy-five plates utilize data from Alfred Kroeber's *Natural and Cultural Areas of Native America*.[6]

Atlases: Specific and General

Of the few atlases that deal specifically with Indian tribes, five offer substantive information useful for the study of Indian affairs. More of them offer useful historic and political maps, and a few include physical as well as land-use maps. For example, *A Zuni Atlas* was prepared subsequent to claims litigation and was prepared by expert witnesses for the tribe.[7] It includes specific cartographic data of territoriality—for example, figure 21, "Area of Zuni Sovereignty, 1846," reveals the overall boundaries of the Zuni Nation and constitutes the base for figure 32, "Area and Dates of Zuni Land Taken," which depicts using various zip patterns lands taken at different time intervals. This is followed by a sequence of maps—figures 33, 34, and 35—that show Zuni Reservation changes from 1877 to 1982.

In contrast, *The Navajo Atlas* provides a set of maps—figures 26 and 27—depicting prehistoric inhabitation and later migrations within the region identified as Navajo today.[8] Figure 28 then reconstructs the "Evolution of the Navajo Reservation," by showing areas by date that were added as trust lands. Part Six discusses and displays the disputed Navajo-Hopi lands. Figure 45 shows the original Joint Use Area as of 1962 and figure 46 reveals the "1977 Disposition of the Joint Use Area."

Oregon Indians is more than an atlas; it is a comprehensive ethnographic and historic document.[9] A section dealing with early US Indian policy in the state includes a map of treaties and cessions based on Royce as well as one of unratified treaties. There is also a map showing displacement of Oregon Indians and another depicting shrinking Indian lands. Subsequent maps reconstruct aboriginal territory, reservation establishment, and changes to

reservations for the Warm Springs, Umatilla, Malheur, Burns, Klamath (revealing termination), Grande Ronde, and Siletz (revealing both termination and restoration of recognition). There is also a map of claims adjudication as based on the ICC.

The *Atlas of Great Lakes Indian History* shows Indian distributions in the surrounding country of the Great Lakes.[10] Map 13 shows the pattern of tribal distributions for 1768. This is followed by a series of maps that depict the frontier in transition for various dates, but they do not reveal tribal territories. Map 22 shows the distribution of Indian and White Settlements, circa 1830, revealing tribal areas as they were undergoing change. Most of the maps in this atlas show Indian villages for various dates and thus indicate tribal distributions, but without boundaries. Map 30, "Land Cessions 1883–1873," essentially relies upon Royce; and Map 31, "Reservations 1783–1889," includes reservations that were later dissolved, when many Indians were relocated to Indian Territory during and following the presidency of Andrew Jackson.

Prucha's *Atlas of American Indian Affairs*[11] adapts the ICC's "Indian Land Areas Judicially Established"(Map 3), and includes a series of national land cession maps (maps 14–22) based on Royce, followed by another series specific to given tribes, including the Cherokee, Creek, Potawatomi, and Teton Sioux (maps 23–32). Maps 33–35 show reservations at different dates, from 1880–1890 to 1987. There is also a series on Indian Territory and Alaska, and a pair of maps showing the Navajo-Hopi Joint Use Area (maps 96–97).

Atlases, of course, vary in their cartographic coverage, especially in terms of including copies of original maps. For example, the *Illustrated Atlas of Native American History*,[12] while covering the time period of 20,000 B.C. to the present, includes a considerable number of original and quite interesting maps, for which a general legend is provided upfront, stating that "the images . . . illustrate the approximate location of various Native American resources, lifeways and culture centers over the time period covered." Historic maps include a Dutch map of John White and Jacques le Moynes de Morgues during the 1560s, which labels various areas with Indian names such as Powhatan, Secotan, and the like. The "Map of New England," a woodcut that accompanied William Hubbard's treatise on King Philip's War, was published in 1677 and reveals a quantum of tribal names, such as "Naraganset" and "Pequid Country." Other maps include John Smith's rendering of Powhatan Country in 1612, a map of Iroquois country circa 1723, and another by German cartographer Johann Baptiste Homann of "La Lousiane" in the late seventeenth century, revealing countless Indian names; the area extends to the eastern seaboard and into Canada. The atlas thus reprints in a fairly accessible volume a good number of the early maps identifying tribes and locations relative to European settlement and movement on the continent. The original maps in the atlas include basic ethnogeography, the fur trade, movements within the Plains, tribal relocation to Indian Territory, and so on. In some respects, maps of Native North America (in 1800, for example) reflect Alfred Kroeber's concern that such maps of tribes/cultures should not include boundaries, and this map does not, only the placement of names. These maps include symbols for animal resources, etcetera. The cartographer for the original maps is Glenn O. Myers.

One other atlas that exemplifies what is in cartographic print is *The Cartography of North America, 1500–1800.*[13] While not specifically designed to document tribes by name or territory, numerous maps include Indian data—e.g., a map attributed to John Smith (1612) engraved by William Hole, which clearly identifies Powhatan, Monacans, and other tribes; Nicolas Sanson's 1656 map, "Le Nouveau Mexique et la Floride," identifies Apaches and others; "Novi Belgii" by Matthias Seutter, 1730, also reveals a quantum of tribal names for the eastern seaboard of New England south to southern Virginia, including Tochwoghs, Minquaas, Matanac, and farther north, Irocoisia. On occasion, maps clearly state, as "La Caroline et Georgie" (1757), by Jean Nicolas Bellin, does: "Pais des Apalaches." Many maps place Indian names but do not attempt to define territoriality. A great many maps are of the continents and otherwise the scale is less than adequate in revealing the Indians' presence. Most of these maps do sustain knowledge of tribal presence and distribution, but do not serve as cartographic representation of tribal lands and territory in any definitive way. Nonetheless the atlas is useful in terms of relating contact dates with tribal groups, although some data have been copied from other sources whose dates may remain unknown.

While there are other maps and a few more atlases, to my knowledge none is as effective in scope or specific relation to tenure and territory as the ones already discussed.[14] Observe also that the "historic" atlases of the various states generally provide cartographic data regarding Indians but are usually derivative of other sources.[15] In fact, few of these atlases offer any original maps and many even lack sufficient tribal data. As a final thought on atlases: it is always worthwhile to check them for subject-matter data *and* for the sources to which the compilers have turned.

Maps in Selective Studies

While the cartographic reconstruction of Native America and Indian affairs relies heavily on official maps, it is also true that scholars have independently developed various approaches to mapping tribes, and their original territoriality and trust lands. Some combination of map sources remains a standard approach whether studies focus on ethnography, geography, history, or other fields. David J. Wishart's *An Unspeakable Sadness: The Dispossession of the Nebraska Indians* and Laurence M. Hauptman's *Conspiracy of Interests: Iroquois Dispossession and the Rise of New York State* both demonstrate the utility of historic sources. In his cartographic reconstruction of the territory and reservations of the Omaha, Otoe-Missouria, Pawnee, and Ponca Indians, Wishart not only has reproduced a number of original land survey maps housed with the National Archives or the Nebraska Historical Society, but also has reconstructed reservations and their vicinities by use of various sources. Hauptman similarly relies heavily on historic sources, original or reconstructed. The time frame of a study contributes importantly to the kinds of cartographic sources a scholar turns to when reconstructing a continuum from the past into the present.[16]

On the other hand, for a study that focuses mostly on contemporary Indian geography, Klaus Frantz's *Indian Reservations in the United States* offers a

number of originally designed (schematic) maps that include spatiotemporal phases in the territorial development of an Indian reservation. While his maps do rely in part on Royce and other sources, these specific maps pursue the same sort of model development I exhibit in this study and have published earlier.[17]

THE SCHEMATIC MAP SURVEY

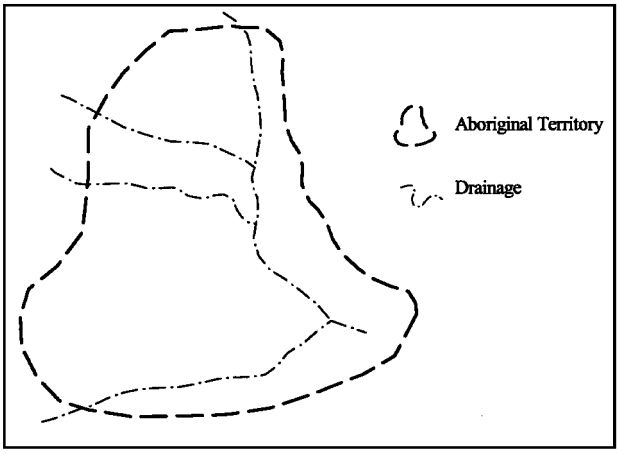
This map survey develops ten subject areas, all possessing both a time and space frame. While several of the schematic maps show overlapping and related content, I have chosen to keep certain data separate in order to focus the discussion as well as anticipate that complex presentations will be confusing to some readers. Schematic maps in this survey include: (1) Aboriginal Territory in Native America; (2) Treaties of Land Cession and Establishment of Reservations; (3) Reservation, Land Allotment, Diminishment of Area, and Termination; (4) Land Alienation and Heirship through Allotment; (5) Lands Displaced and/or Despoiled; (6) Land Claims: Aboriginal Territory to Judicially Established Areas; (7) Former Territory: Hunting, Fishing, Water Rights, Sacred Sites, and Land Restoration; (8) Reservation and Community: Contemporary Cartographic Representation; (9) Reservation Land Use and Resource Management; and (10) Environmental Jurisdiction.

Schemes 1, 2, 8, and 9 are fundamental to all trust lands. Schemes 3 and 4 apply only to those reservations that were allotted in the past. All other schemes relate variously to some but not all reservations. However, schemes 2 and 6 correlate inasmuch as land cessions form the basic evidence in the adjudication of land claims. Moreover, various land restorations relate to litigation as well as congressional settlement acts (for the Catawba, the Penobscot, and others). I chose these subject areas because they fairly represent a continuum of territorial changes even though the sequence in its entirety does not apply to any one reservation. It would be foolish to believe that I or any other person can readily correct the cartographic record in all these aspects. Rather it is my notion to demonstrate in a schematic way the wide range of changes—i.e., the various stages—in the evolution of Indian land tenure and territoriality so that students of Indian affairs can better decipher the specific changes for tribes they are researching.

The generalized scheme that follows certainly is not definitive, and readers should not assume that in every case the suggested sequence always follows as outlined. Moreover, unallotted—i.e., tribally held—reservations do not exhibit the land configurations or problems associated with allotment or heirship. On the other hand, most allotted reservations exhibit the ineffective use or idleness that has accompanied fragmentation and today necessitates yet frustrates efforts at land consolidation by tribes and individual owners and their heirs. Less prevailing in Indian Country are territorial matters dealing with reservoirs, mining, and hazardous materials. Indian gaming pursuant to the Indian Gaming Regulatory Act of 1988 may now be characterized as prevalent. Where applicable, I have discussed certain tribes and reservations and/or supplied references to specific studies. In addition, discussions

include selective examples of terminated tribes (e.g., Klamath), reinstated tribes (e.g., Siletz and Grande Ronde), as well as newly created or expanded reservations (e.g., Pequot and others, mostly in the East). Furthermore, some reference is made to open and closed reservations, such as the Yakama (in Washington), but again tribal offices would be the primary source of maps. Keep in mind that none of the schematic maps intend to refer to real places: they serve only as models of real places. It is hoped that this paper serves as a reference guide to sources that display maps, elaborating on the cartographic record and related matters.[18]

ABORIGINAL TERRITORY IN NATIVE AMERICA



MAP 1. *Map by James A. Woods.*

Any map of aboriginal territory necessarily depends upon multiple sources. Early efforts sought to include cultural data, such as language and territoriality. For many decades these cartographic attempts withstood intense scrutiny. Perhaps the establishment of land claims litigation led many tribes to contest the accuracy and efficacy of such maps, for even now many tribes do not concur with leading cartographic, ethnographic, or historic experts on the appropriate delimitations of homelands. Nonetheless we have a record of several hundred territorial maps that received considerable input from tribes that litigated claims before the ICC between 1951 and 1978 and the Court of Claims thereafter. I have chosen maps which apparently served as the bases for maps utilized in later litigation. This includes the dominant work of Alfred L. Kroeber, his students, and other contemporary scholars.[19] At present, researchers interested in Native American maps have not added importantly to the discussion of indigenous territorial cartography—Indian maps as such do not represent a wealth of data for the cartographic reconstruction of Native America, but they do shed light on how to interpret post-contact maps. For example, geographer Robert Rundstrom points out that, "from the indigenous point of view, history is suffused with domination and disenfranchisement at the hands—and maps—of the inscribers."[20] Mark Warhus, when referring to indigenous cartography, notes that "to read these Native American maps it is necessary to suspend western preconceptions of what makes a map."[21] He speaks of indigenous maps as "pictures of experience." No doubt, indigenous cartography will come to serve the tribal concern for more accept-

able maps, but most of the exhibits suggest that Indian cartography has not focused on territoriality in the instance of delimiting peripheral bounds.[22]

A map of aboriginal or Native America thus reflects the multiple contacts in the field with various tribes, remnants of tribes, bands, and the like, as well as the collective efforts of academia and officialdom to reconstruct Native territoriality. What is representative are maps prepared mostly by ethnographers. From time to time we'll see the modest inroads of tribal interpretation of reconstructed maps of aboriginal territory as based perhaps on Native cartography, but this is no universal approach to correcting countless territorial maps. As yet, we have not even seen the careful comparative review of claims adjudicated maps and earlier ethnographic ones, although adjudicated areas do not necessarily equate with tribal interpretation of aboriginal territory. In all fairness, when examining the documentation offered—by Kroeber, for example—we recognize the thoroughness in gathering all possible sources, yet in the final analysis the boundaries drawn on maps reflect interpretations by non-Indians, a criticism often asserted by Indians.

In my correspondence with Daniel J. Gelo, an anthropologist, I am made aware of a divergent view of the reconstruction of territoriality as opposed to territory. As he puts it,

> [T]his seems to be gist of the problem . . . a group's *territoriality* is perhaps not best represented by a map at all. . . . Rather, a verbal description of territorial principles (as evinced in subsistence practice, language and cognition, oral tradition, and historical evidence of actual locations and activities), reconstructed from native and non-native sources and augmented by statistics and several visual representations, is more likely to capture *territoriality*.[23]

Several recent studies, including that by Gelo, suggest additional means to recreate the aboriginal map of North America. Gelo notes,

> The Kiowa homeland . . . was first part of the Comanche homeland, at least for a couple of generations. Yet while the Comanches are usually associated with the Texas panhandle and adjacent parts of Oklahoma and New Mexico, the central Texas hill country was part of their regular space for several generations. In such cases range . . . may well be the better operational term.[24]

It should be emphasized, as a tentative conclusion, that no one approach has universal appeal for the reconstruction of native territoriality. For example, the homeland approach and what is sometimes referred to as "place-and-identity" focus on the core area and not the periphery, thus only providing data toward establishing the locus of Native mobility but not the totality of claimed territory.[25]

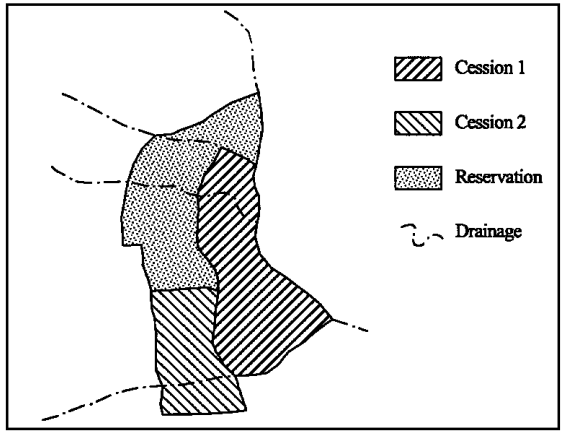
Cartography has also served in the reconstruction of frontier delimitations that seek to separate tribal and white settlement areas. Such maps thus reflect both the retention of aboriginal territory and the cession of other Native areas. By use of original and reproduced map copies, historical geographer Louis De

Vorsey Jr., in his *The Indian Boundary in the Southern Colonies*, reconstructed the frontier limits of tribes then occupying extraterritorial lands beyond southern settlement.[26] In effect, the wordings of countless treaties also seek to establish boundaries between tribes and impending white settlement.

This discussion should not overlook another genre of map that is more akin to Kroeber's approach: maps such as those by William C. Sturtevant or by the National Geographic Society. The former—"Early Indian Tribes, Culture Areas, and Linguistic Stock"—is a plate from the *National Atlas*. Tribal distributions focus on broad general bounds utilizing linguistic terminology. Sturtevant cites as sources much of the literature that I include here, such as by Harold Driver, Robert Heizer, and C. F. and F. M. Voegelin. "Indians of North America" was a *National Geographic* supplement in 1972, and again utilizes a culture area approach not unlike that of Kroeber's or Sturtevant's maps. And in fact, Sturtevant was its principal consultant.[27] Such maps do not pretend to represent political geography, but rather ethnogeography.

TREATIES OF LAND CESSION AND ESTABLISHMENT OF RESERVATIONS

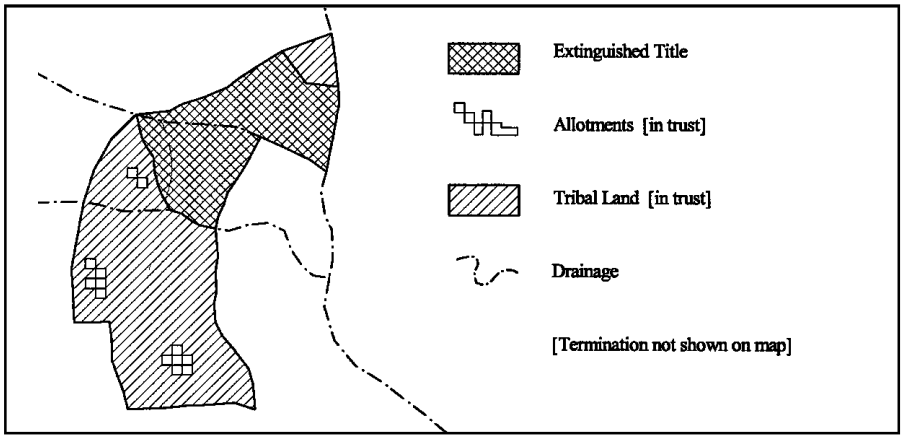
Tribal land cessions and reserves as well as the establishment and modification of trust lands are a matter of official cartographic record. I have already identified the compendious work of Charles C. Royce and his staff at the Bureau of American Ethnography more than a centuryago; this cartographic volume of land cessions still represents the foundation for all other land records.[28] Now and then, of course, it is inferred that some treaties were not adequately translated into maps, but in general Royce continues to be the basis for all litigation dealing with *recognized title*, or title based on treaty negotiations and therefore acknowledged by the federal government.[29] In many instances more than one treaty led to the successive reduction of tribal territory and the establishment of reservations, whence by treaty, statute, or, more often, executive order further reductions occurred. Most cessions placed Indian lands in the public domain, and thereafter the General Land Office opened these lands to settlers under varying entry laws, such as the Homestead Acts. Additionally, railroads secured grants to alternate sections (approximately 1 square mile, or 640 acres, each) along various routes, thus precluding the inclusion of certain lands within given reservations. While Royce includes countless executive orders, a greater number of those that reduced trust holdings were promulgated subsequent to the publication of his compilations.



Map 2. *Map by James A. Woods.*

What is difficult to reconstruct as working maps are the countless adjustments to trust lands during the era when these executive orders went into effect.[30] Unfortunately, executive orders too often came into conflict with the surveying and publication of plat maps, in part because two different groups of public officials engaged in the mapping of the West: the General Land Office responsible for the public domain and the Office of Indian Affairs. Keep in mind that plats were based on field observations at a given time by surveyors, military personnel, and others. Not only were some cartographic data not mapped to the scale of the map, but executive orders often did not enter into the mapping of Indian locales.[31] Agency personnel, for one thing, were not regularly in touch, and it was not until either Indians or homesteaders contested claims to given parcels that errors came to light. While one can turn to Royce for official record of executive orders reporting land cessions or reserves, other map sources are essential to the reconstruction of the cession history of any reservation.[32] Official negotiations with Indian tribes via treaties ended in 1871, and were replaced by agreements, statutes, and executive orders. Moreover, adjustments in Indian land tenure continued throughout the twentieth century, necessitating that researchers even examine congressional hearings and the wording of statutes to reconstruct the land status of many reservations.

RESERVATION, LAND ALLOTMENT, DIMINISHMENT OF AREA, AND TERMINATION



MAP 3. *Map by James A. Woods.*

Even before passage of the General Allotment Act (1887), a number of tribes underwent selective allotment of tribal acreage. From 1887 on, allotment became prevalent throughout Indian Country although many reservations escaped this prophetic form of land tenure. For virtually all reservations, boundary adjustments occurred a number of times even if allotment didn't take place.[33] In many instances, cartographic corrections may only appear on working maps at government or tribal offices, and up-to-date maps may only be known to tribal realty personnel. For most of the years prior to the 1950s, one would generally find

allotment data only by visiting field offices of the BIA or tribal offices on reservations. No doubt this has much do with the difficulty of assembling the detailed map information that can and does change in every year and perhaps several times a year. A few specific studies of reservations reveal varying patterns that include tribal, allotted, and non-Indian lands. One early study of reservation tenure patterns was by geographer Harold Hoffmeister whose review of the Consolidated Ute Indian Reservation (in Colorado) includes a detailed map of several land tenure patterns as based on map compilation by the author, utilizing BIA and Colorado Geological Service data. Hoffmeister was perhaps the first to outline a geographic approach to the study of Indian land tenure in its relationship to land use.[34]

As other agencies besides the BIA began including trust land data on maps, additional sources became available. At various dates, the Bureau of Land Management (BLM) has issued a series of Surface Management Status maps. For example, the "Blackfoot Quadrangle, Idaho" map encompasses the northwest portion of the Blackfeet Indian Reservation and adjacent public and private lands. This map is based on earlier topographic maps and aerial photographs, but is not field checked. Another edition entitled "Lodge Grass, Montana-Wyoming" covers a good portion of the Crow Indian Reservation and reveals a mixed configuration of patented lands (former allotments), although my copy does not show a beige tone in the box for patented lands. One other edition will be instructive to review: "Palm Springs, California," which includes the Agua Caliente Indian Reservation and parts of others (Augustine, Cabazon, Cahuilla, Morongo, Santa Rosa, Soboba, and Torres-Martinez). It does attempt to show allotted parcels but not in the orange tone reserved for Indian lands. Thus to the uninitiated it is difficult to decipher the land tenure status of tribal and individual Indian trust lands.[35]

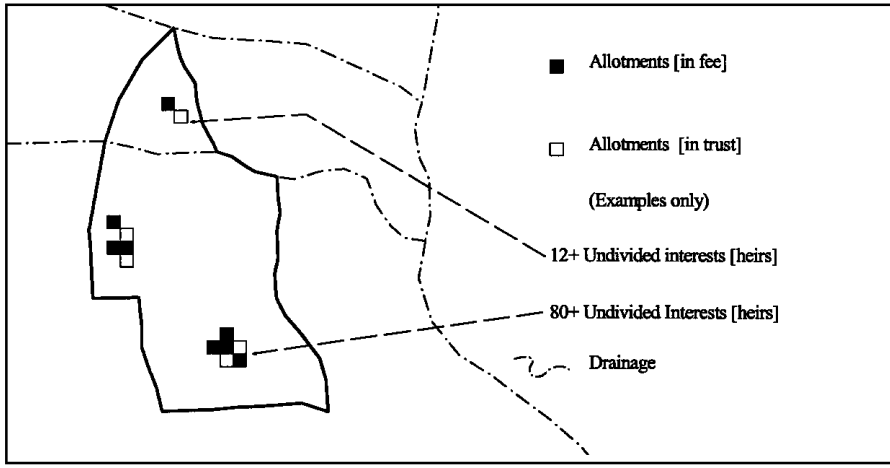
BLM has also produced a state series. The one of the state of Utah entitled "Areas of Responsibility and Land Status Map" includes the Uintah and Ouray Indian Reservation as well as several smaller reservations. It does attempt to show patented lands within that reservation, but does not distinguish the boundaries of smaller allotments.[36] In any or all of the maps discussed, the publication date may be one or several years after field compilation of tenurial data.

It is not easy to ascertain which tribes have published maps that may be acquired by visiting tribal offices or by writing for them. Some years ago while engaged in fieldwork on the Rosebud Indian Reservation (in South Dakota) in the mid-1980s, I acquired such a published map by the Rosebud Sioux Tribe. The map shows allotted, tribal, and private lands for Todd County, South Dakota, but indicates that there are Indian lands in the adjacent counties of Gregory, Lyman, Mellette, and Tripp. At the time, about half of the reservation (Todd County) was held in private holdings. I noted then that the tribe still held a parcel along Highway 83 at the Nebraska border, which is where they eventually constructed a casino, opened in 1995. For another example, the Agua Caliente Indians of Palm Springs (in California) have published a much less detailed map of their checkerboard reservation. It does show the alternate sections (640 acres) and a small amount of subdivision within a handful of sections, suggesting the land equalization pattern of 1959. But it does not intend to serve as a research reference.[37]

As for diminishment of reservation areas, such events may be dated in terms of litigation and/or administrative action. For example, if one examines some earlier editions of the official South Dakota state map, some reservations—e.g., the Rosebud discussed previously—were shown much smaller in area, especially by eliminating the trust status of certain counties. This is because in South Dakota earlier decisions—in 1908 and 1910, for example—*diminished* the external boundaries of reservations due to earlier allotment of tribal land and the opening of the remaining acreage to non-Indian acquisition.[38] Diminishment of reservation areas in general has been a major cause of conflict between Indians and non-Indians residing on many reservations today.[39]

In the 1950s Congress passed legislation that led to the termination of federal trust status for a number of tribes; this national policy led to the removal of reservations from the official BIA maps. From time to time, the BIA promulgated data and some maps that reported tribal terminations by area. Many years later, the president, by executive order, or Congress, by statute, ordered the reinstatement of a select few reservations, including Menominee and Siletz, among others. I have never seen an original map showing the extent of the termination policy, and perhaps only the tribes involved could provide cartographic data where some lands were sold and others retained by the terminated tribe. General maps issued by the BIA have indicated terminated reservations.[40]

LAND ALIENATION AND HEIRSHIP THROUGH ALLOTMENT



Map 4. *Map by James A. Woods.*

Almost from the beginning of land allotment, some allottees and then their heirs sold off parcels, diminishing trust holdings within reservations and thus increasing the number of acres held by non-Indians and simultaneously increasing the demographic presence of whites within reservation borders. Because federal policy designates that state laws of devisement govern the inheritance of Indian allotments, too often allotments left intestate by an allottee have ended up in undivided fragments held by numerous heirs.[41] It

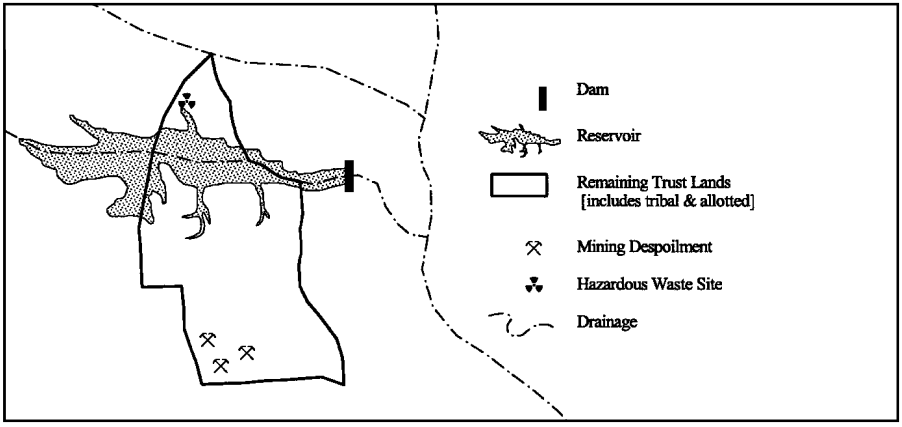
is hard to ascertain how accurate field maps at BIA or tribal offices are today, and the published record gets out of date very quickly. Derivative maps as based on field and archival research may have been accurate at the time of mapping, but not for any prolonged period thereafter. Nonetheless, considerable allotted lands continue to be encumbered so that heirs have been unable to utilize or develop the parcel(s).

At one time the federal government sought to alleviate these proprietal conditions, granting, for example, a majority of landholders or a majority of undivided interests in a parcel the right to pursue some form of development. Tribal realty offices would be the best source to determine how many encumbered parcels—for that matter, how many alienated allotments—were purchased back into tribal administration.

Tribal efforts to consolidate allotments locked up in complex inheritance patterns have been going on for several decades but not with great success. I know of no comprehensive maps of these tribal consolidation programs; surely, several tribes have prepared their own. Unfortunately, litigation leading to a decision by the Supreme Court and further action by Congress have discouraged some approaches to such consolidation. Some tribes had relied on the common law of escheat as a means to order the acquisition of encumbered parcels. Other means, such as the Tribal Land Enterprise of the Rosebud Sioux, have not proven to be a worthwhile alternative.

A subgroup of maps might be those compiled by various tribes showing the repurchase or consolidation of former allotted lands. For example, in recent years the Comanche in Oklahoma have been buying such parcels.[42] (See the later discussion on land consolidation under "Reservation Land Use and Resource Management.")

LANDS DISPLACED AND/OR DESPOILED



MAP 5. *Map by James A. Woods.*

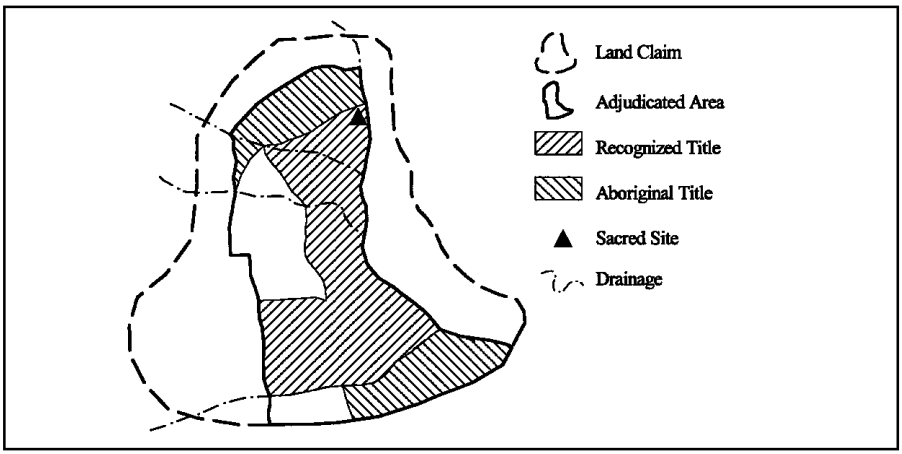
It is common knowledge that Indian lands have been sacrificed for the establishment of dams and reservoirs, mining operations, and waste and hazardous

materials disposal. Flooding of Indian lands is by far the most prevalent across Indian Country. Examples include dams on the Missouri River identified with the Sioux tribes,[43] the Allegheny River and the Cornplanters, Seneca, and others. The best sources of cartographic data are the agencies that design, plan, and construct water works, including the Army Corps of Engineers, which has a store of excellent maps of various projects (one must write to specific Engineer Districts to secure useful maps),[44] and the Bureau of Reclamation, which has constructed numerous dams that involve the inundation of tribal lands. As early as the construction of Hoover Dam (Boulder Canyon Project) the latter agency has been responsible for the inundation of Indian trust lands as well as archeological sites as in the case of Lake Mead on the Arizona-Nevada border.[45] Some primary map sources have been prepared by archaeologists and other scholars.[46]

Subsequent to the inundation of Indian lands, tribes have had to make various concessions, including moving to other areas within reservations or relocating off-reservation. Jack Hunt reported on the resource management of the Warm Springs Indian Reservation (in Oregon), where several riverine tribes relocated after the construction of The Dalles Dam led to the flooding of former tribal lands along the Columbia River. These Indians have sustained fishing rights and for more than thirty years have taken a progressive approach to environmental planning. I reconstructed the land uses and settlements lost by members of the Capitán Grande Indian Reservation in Southern California when the El Capitán Dam led to the inundation of that reservation. With repayment in hand, the Indian band divided into three groups—by purchasing nearby lands, one group established a new reservation at Barona, another at Viejas, and the remaining Indians secured homesites within the San Diego urban area.[47] This account portrays a happy ending, which may have been true for some resident Indians, but others decried the necessity to relocate at all.

As for mining and the disposal of hazardous materials, while many tribes have negotiated contracts for such operations on their lands, the surface destruction too often renders the lands unusable in any other form. Such is the situation for coal mining by the Peabody Company in the Black Mesa area of the Navajo Indian Reservation. One would expect that the mining companies produce their own operating maps and that tribes maintain working maps of mineral reserves and mining activity as well as infrastructure. A similar observation would apply to waste or hazardous materials disposal. Ward Churchill and Winona LaDuke have developed several maps dealing with mining, including one of the "Four Corners Area Energy Exploitation," and another of "U.S. Corporate Interests in the Greater Sioux Nation." Some data cite the *Navajo Atlas* and especially studies of "National Sacrifice Areas." Separately, LaDuke has produced other relevant maps: "Nuclear Waste," which displays existing and proposed nuclear waste sites as well as tribes involved in MRS (monitored retrievable storage) sites, and "Northern Cheyenne," which includes the distribution of coal reserves.[48]

LAND CLAIMS: ABORIGINAL TERRITORY TO JUDICIALLY ESTABLISHED AREAS



MAP 6. *Map by James A. Woods.*

Since the mid-nineteenth century, tribes have filed claims to territory acquired by conquest, treaties of land cession, purchase, and unconscionable means. In 1946 Congress created the Indian Claims Commission.[49] Until 1978 that tribunal heard land claims as well as other cases (dealing with monetary accounts, for example). At the time the ICC retired, it published a "judicially established" map which summarizes the data submitted as exhibits for all the cases heard and adjudicated.[50] Many exhibits later showed up in various studies of different tribes and in general review of litigation.[51] The judicially established map, of course, was based upon more detailed cartographic exhibits prepared both by expert witnesses for the plaintiff tribes and by the government's legal staff for the defense. Originals of such maps may be housed in the National Archives, with the Land Division of the Justice Department, or with the experts who prepared them. Derivative or photocopied maps, of course, abound, especially in the various volumes that include briefs, facts of finding, and decisions of the ICC.[52]

To be sure, a major concern relates to the quality of base maps from which court exhibits were derived. Expert witnesses included many ethnographers, historians, and legalists but few geographers, who supposedly are the map specialists.[53] One may surmise that claims adjudicated maps now represent the closest approximation of some but not all tribal territorial areas. If adjudicated areas do correspond to tribally claimed aboriginal territory, one still must question whether the cartographic rendition truly represents the historic area. Careful reading of countless findings in the claims cases tells us that many expert witnesses, whose testimony influenced the decisions of the ICC, had turned to Alfred L. Kroeber, University of California, Berkeley (UCB) professor of anthropology and the leading authority on Indian culture areas, territoriality, and ecology, and to his former students, who continued in the Kroeberian tradition. Kroeber's work began as the twentieth century commenced, and he was able to enlist the assistance of Indians of many tribes and communities. His rank as a

scholar in the study of Native America was almost unrivaled and ICC commissioners, lawyers, and colleagues turned to his expertise in developing appropriate theory and strategy in claims litigation. Kroeber's publications, including his maps, came to dominate the study of indigenous political geography.[54] But even in his time, informants were often in conflict over territoriality and Kroeber and his students tended to make judgment calls.

Kroeber's compendious *Natural and Cultural Areas of Native North America* focused on culture and as such was not limited to concepts and practices of territoriality. While his territorial delimitations were ethnographic, they were not intended to be political. His pair of maps designated as Map 1a and Map 1b, in a sense, fuse cultural and tribal data about place. As he noted, the pair of maps "makes no pretense of original research or of finality. It has involved many judgments between differing delimitations." When there were "irreconcilable conflicts," natural features were relied upon and of those, "watersheds rather than streams." Furthermore, as he noted,

> [T]he map does not . . . represent conditions at one absolute date nor even at one relatively consistent historic moment, such as that of discovery. It attempts to indicate tribal territories approximately as they were constituted at the time of first occupation by Europeans.[55]

Since Kroeber's focus was culture, he found that boundaries represented the weakest feature when mapping whole cultures. He spoke of tribes living along an *interarea* boundary as having much in common. He would have preferred a cultural map without boundaries. To be sure, many of the sources cited in Kroeber's work included references to Native informants, but ultimately interpretations were those of the scholar.

These previous remarks do not intend to denigrate either Kroeber's efforts or those of later researchers. There are excellent examples of careful boundary delineation, as by Kroeber, and especially his student and expert witness in his own right, Omer C. Stewart, whose Western Shoshone map resulted only after the careful sampling of several dozen delimitations of these tribal people.[56] Despite some Native informant input, many of Stewart's sources, like those in Kroeber's maps, are essentially derived from non-Indian interpreters. Demonstration of this point becomes clear when one utilizes the *Handbook of North American Indians* series. For example, in the Great Basin[57] volume of the series several chapters identify tribal territory, and cite ICC cases and a number of important ethnographic and historic sources. Stewart is only one of many authorities cited. Note, however, that the ICC in determining tribal boundaries in the Great Basin, relied heavily on maps prepared by Doty during the negotiation of treaties in 1863.[58] Stewart and other expert witnesses gave testimony to counter government attorneys who believed that "territorial boundaries were so vague that accurate bases for compensation could not be determined."[59] The question remains whether one is saying that boundaries of tribal territories were more accurate because of Native information or that provided by field observers and scholars.

Omer Stewart's detailed cartographic research needs more elaboration here because it suggests the care that must enter into reconstruction of abo-

riginal territory. For the Great Basin, he reconstructed territories of many tribes, having turned to countless scholars for data.[60] Stewart relied upon a technique known to geographers as covariant research, where, for comparative purposes, one superimposes multiple data on a common base map. Covariant research may or may not yield specific configurations of tribal areas, but it has been one additional methodology as a means to confirm older historic data and that of informants.[61] By similar means he argued that "the device of indicating a separate territory for the Bannock in Idaho appears to be completely improper. It is much better to show the Bannock and Shoshoni as jointly occupying the area where the Bannock are identified."[62] Of course, the documented record does normally report the work of field observers and later compilers and cartographers who, no doubt, were just as subjected to Euro-American cartographic interpretations, which unfortunately somewhat nullifies or totally eliminates the input of Native informants.

Other early maps of Native territoriality were relied upon and criticized in the process (a map by Harold Driver et al., for example).[63] While Driver attempted to depict distributions of racial, linguistic, and other cultural data and while the map did bring together new and hitherto unpublished materials, its tribal boundary delimitations were not so definitively represented. Erminie Wheeler-Voegelin criticized Driver and his colleagues for assigning boundaries to specific areas of occupancy where tribes had never been before.[64] Verne Ray, evaluating the Driver map in terms of claims litigation, observed:

> It is unfortunate that work of such a character should appear at a time when the welfare of the Indians may be affected by such uncritical and unprofessional use as may occur in litigation before the Indian Claims Commission.[65]

Robert F. Heizer—another Kroeber student—published a small but significant compilation that related language and territory in Native California. Although this ethnologist offered many cogent observations about the relationship between language and territory, he did not really unlock approaches to the accuracy of mapping such data. However, he did note of Native land tenure that numerous groups did utilize boundary markers or natural features as part of their territory. He reported earlier observations about the importance of watersheds as boundaries, with peaks, ridges, or summits serving as markers.[66] He cited others who reported that some groups taught their children boundary markers so that they would not "stray beyond their own territory and be shot for trespassing."[67] Heizer did demonstrate how much research had existed prior to 1966 and largely at the instigation of Kroeber and his students.[68]

It is important to remember that although treaty boundaries deal with *recognized* title—boundaries the US government acknowledged as legal—this is not the same thing as accepting tribal delimitations of territoriality—with reference to either *original* or *recognized title* lands. Treaties have been challenged many times in terms of accuracy in the field and in cartographic rendering. The ICC relied upon Royce's compilations and made Royce map numbers legal entities for both cartographic purposes and for the determination of

acreage in monetary awards. This gave treaties and Royce's work considerable credibility before the ICC, especially since the commission adopted Royce as the official legal source for recognized title.[69]

Of course, the fundamental tribal concern was aboriginal boundaries, the delineation of which depended upon the work of expert witnesses. These boundaries focus on original title, which became adjudicated as the key phase of litigation before the ICC, on occasion the Court of Claims, or the Supreme Court. While there are discrepancies in many Royce renderings of treaty boundaries, recognized title boundaries have not been generally challenged. But original title boundaries remain in question because so many tribes do not accept the final lines drawn on the ICC adjudicated map for a number of reasons. So-called "judicially established" or adjudicated areas too often fall far short of tribal expectations as to how they do or do not enclose Native culture and in terms of the total acreage *times* the monetary value of the land per acre at the time of taking.

If the intent of many tribes and their experts today is to contest the ICC final map—the more detailed exhibit maps upon which the final map is based—then new litigation would have to challenge the research and cartography of those very maps prepared and submitted as exhibits by expert witnesses.[70] But would revisiting the claims research process yield a more rewarding final map of Native America? And would it yield more acceptable maps for tribal purposes?

In the mid-1950s, a group of scholars came together to establish the interdisciplinary field of ethnohistory. The Society for Ethnohistory was created and with it began the publication of the journal *Ethnohistory*. In this same period many of these scholars debated the issues involving the adjudication of Indian land claims, including importantly the question of establishing and delimiting tribal boundaries. Several supportive arguments of tribal mapping concluded that linguistic data can provide a sufficient picture of tribal territoriality; in such instances, reliance on Indian scouts and their linguistic affiliations were utilized.[71] Anthropologist Nancy O. Lurie had contrasted interpretations of contiguous territories offered by the plaintiff tribes as a response to the Justice Department's theory of land use based on "nuclear areas." Lurie contended that:

> As far as anthropologists are concerned, the question remains open whether the traditional techniques of tribal mapping are simply an established convention convenient for academic purposes, or whether such maps reflect the empirical conclusions of many independent researchers in regard to the proper designation of territoriality of human groups generally considered.[73]

Many of the arguments for or against the determination of tribal boundaries also turned on the meaning of such terms as *tribe* and *occupancy*. J. A. Jones noted that *tribe* has served in countless ways and may refer to linguistic groups, political, cultural, territorial factors, and "even accidental reservation coalescences." He posed the idea that "tribal consciousness may be in large part a reaction to White pressures insofar as North American Indians are concerned."[74] Ethnographic research indicates that most Indians comprised "small, localized, autonomous units" and occupied limited areas. However, the ICC mandated the meaning of

definable territory and scholars were obliged to go beyond "conceptual contiguous boundaries." Jones suggested that "new, realistic mapping conventions will have to be devised," stating further that,

> Indian groups had their concept of ownership of territory materially sharpened through contacts with Whites who were interested in obtaining land for their own uses. Consequently most modern Indian groups think in terms of conceptual boundaries . . . [which] usually do not represent the areas of actual use, and consequently fall short of the Court's requirements for proving 'Indian title.'[74]

Nancy Lurie carries the argument further with her comment that "extreme and explicit boundary-consciousness in one tribe may not be repeated in another."[75] As she noted, "in the mapping of tribal territories, the data are of equal validity to the ethnologist whether his informants are conscious of how far they extended their operations or whether the information lies buried in their unconscious behavior."[76] Moreover, she and others observed that at the time treaties were negotiated, most of the territory in question was unsurveyed and misunderstandings arose, in part, because of the inadequacies of interpretation. Some tribes ceded territory of adjacent tribes or did not include all the land that lay within their conscious boundaries.[77]

To what degree have other disciplines abetted the determination of accurate maps of Native territoriality? Historians, sociologists, and others were involved in research and presentation of testimony that included delimiting tribal boundaries. Because of their long-standing involvement in archaeological, ethnographic, and ecological study of the American Indian, it is apparent why anthropologists would be asked to participate as expert witnesses in land claims litigation. Few historians offered more than an account of earlier evidence of the whereabouts of tribes at or after contact. Several historians who explored frontier history have written about contact times and tribal locations and movements. As a geographer, I would point out that our profession made only the smallest of contributions to the theory and practice behind expert testimony in the claims cases. To what extent geography influenced anthropology depends on how one interprets the academic relationship of Alfred Kroeber and geographer Carl Sauer, both of whom worked at the University of California, Berkeley, and whose students crossed over in their studies of what used to be termed *anthropogeography*. Ethnographers, even more than historians, recognized that a very heavy burden fell on them and their ethnographic research methodology in order to ascertain the appropriate delimitation of tribal occupancy and use, and thus establish boundaries. Geographers certainly can not—dare not—fault colleagues in these sister disciplines, but our general lack of interest in the Indian and his past or present occupancy of the continent explains, in part, why so few geographers became contracted expert witnesses and why today only a handful have explored American Indian geography.[78] Ultimately, we must acknowledge the productive contribution of anthropology to the reconstruction of Native American territoriality even if we find some of the earlier data questionable.

For the official interpretation of the assembled expert testimony, we must rely upon Richard W. Yarborough, one of the commissioners, who edited the

"judicially established" ICC map, and identified the persons and agencies responsible for the compilation. He observed:

> Any mapping of Indian lands must draw on the results of the prodigious industry of Charles C. Royce. . . . His translation of the often-vague treaty calls into precise boundaries [sic] created an indispensable reference for all subsequent students of Indian land areas. Thus mapping the cessions, however, is a subtractive process, and often the cession did not match the true ownership of the land. This map [the judicially established one] is a positive expression of land determined to have been owned, without special reference to the cession or extinguishment process. . . .[79]

Yarborough noted that many Royce areas remain intact on the map. He also reminded us that "the witnesses' often differing opinions as to tribal locations and their extent were reconciled by the Commission in its decisions announcing what had been proved, and delineating the boundaries of the Indian title tract."[80] He poignantly commented: "Indian title . . . is completely a creation of our legal system, and American Indians may properly *disclaim having had any choice in creating it or defining it.*"[81] In all fairness to Yarborough and the staff personnel who compiled the ICC map, they can not be faulted for their renderings. The data were already set in concrete, so to speak, by the ICC decisions, which, in turn, relied upon expert witness testimony, including maps, which relied upon earlier official and scholarly interpretations.[82] If there is cartographic error as tribes assert, then upon whom must we place blame?

Keep in mind that adjudicated tribal areas determined by law and justice generally supersede or displace any territoriality defined by tribes. That is, it is one thing to say that indigenous cartography played some role in finalizing Native territoriality for litigation, but there is a certain finality, based on the principles of precedent in law, that endorses legal/litigious cartography as the definitive product.

Also, it would take considerably rigorous litigation to unseat the adjudication process, for it would call into question not just a single boundary but perhaps the entirety of judicially established boundaries.

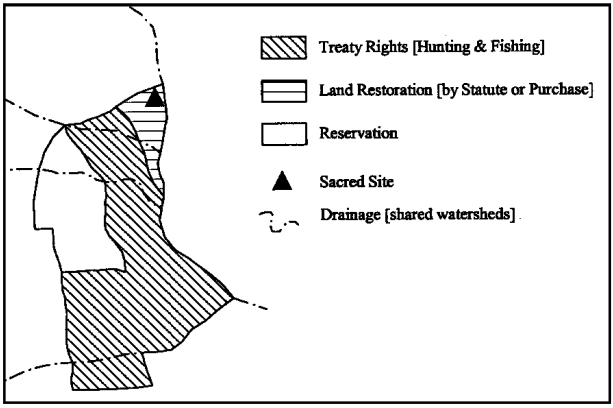
Legal boundaries, of course, are a convenience or artifact of the judicial process; they need not fully represent indigenous or even ethnographically derived boundaries. There is a precedent in claims litigation for creating various kinds of artifacts; for example, "The Indians of California" was created as a legal entity in order to litigate indigenous land claims of California bands and tribes in the aggregate.[83] In California more than two hundred bands, triblets, and tribes remain separate and distinct ethnic and legal entities today. But the bulk of the state of California became the aggregate aboriginal territory. A number of separate dockets were "conveniently" consolidated at hearings before the ICC. Both reserved and ceded areas as reported by Royce were aggregated statistically and any separate and distinct maps of claims areas were set aside as no longer relevant to any final decisions, including basing monetary awards on specific tribal acreages. But Kroeber's own tome on California would refute the notion that one can generalize about Native territoriality in this state.[84]

Despite Kroeber's candid comments on the limitations of his tribal and cultural area maps, and despite the publication of maps that independently arrived at tribal distributions in North America, Kroeber's delimitations of tribal areas were borrowed for *House Report 2503*, published in 1953. This encyclopedic document appeared a few years after the Indian Claims Commission began its tasks and during the heyday of the termination policy in Indian Affairs. The report states that:

> The 77 tribal maps . . . are intended to show the present locations of individual tribes in conjunction with their original ranges. . . . The original range does not designate an area of absolute occupation by the individual tribe. Instead, it is used to indicate an area within which the tribe operated at one time. *It is to be understood that in most cases the tribe actually occupied only a very small portion of the original range.* . . . The original ranges are designed to indicate the areas in which the white settlers encountered the tribe in question during the period of actual occupation, not that of initial discovery.[85]

One should not find it strange that several tribes have refused monetary awards and still contest the decisions of the ICC and the courts. Because this political/legal situation persists—as with the Oglala and Teton Dakota, the Pit River (in California), and the Western Shoshone—a "title cloud" may still hover over former tribal lands that were otherwise adjudicated in the claims cases.[86] For these and other reasons, it may prove very difficult to reconstruct a map of Native America that is equally acceptable to the tribes, scholars, and public officials. However, other maps related to tribal land claims have been produced as based on the documentary evidence. For example, David Wishart produced a pair of maps dealing with payments per hectare and fair market value per hectare.[87]

FORMER TERRITORY: HUNTING, FISHING, WATER RIGHTS, SACRED SITES, AND LAND RESTORATION



MAP 7. *Map by James A. Woods.*

While Indian tribes "won" monetary awards for the loss of territory, that loss has continued to rankle many of them. Territorial losses ultimately terminated hunting and fishing over traditional ground despite the standard wording of treaties—*in perpetuity*.[88] Non-Indian neighbors within the same watersheds appropriated waters destined

to flow through tribal lands.[89] Sacred sites were often desecrated or made inaccessible once land ownership shifted to homesteaders, mining companies, and the like. Such sites on public lands have only recently become more accessible; long-term public-lands agencies have not been champions of tribal claims to sacred places.[90]

In fact, under treaty provisions many tribes have retained fishing and hunting rights in perpetuity. Tribes of the Columbia River watershed represent an important group that have litigated these rights. State environmental laws have sought to restrict specific kinds of uses despite the wording of treaties, but generally the courts have sustained tribal rights in specific cases.[91] As for watersheds, tribes are vested holders of rights to water under the Winters Doctrine—decreed by the US Supreme Court in 1908—but they must also share water with non-Indian neighbors by virtue of occupying common watersheds.[92] Wildlife management is also a consideration as to who has jurisdiction on or off a reservation. While a number of tribes have organized wildlife management on the reservation, conflicts and litigation often relate to provisions of the Endangered Species Act.[93] The Columbia River Inter-Tribal Fish Commission recently proposed a restoration plan for salmon within the Columbia River watershed. While there is considerable literature on the topic, only a limited number of maps exist and of those few offer more than general geographic data available in other forms. Such maps may be available for use by the agencies involved in planning and in litigation (the Inter-Tribal Commission and the Army Corps of Engineers, for example).

Because of confusion and contest over tribal continued use of former territory, some tribes have recently claimed rights to the utilization of adjudicated territories as decided by the ICC or the higher courts, especially in conjunction with tribal demands for the exclusive access and use of burial grounds and other sacred sites located on former tribal lands. Moreover, some tribes disagree with the wording of the Native American Graves Protection and Repatriation Act (NAGPRA) that imposes the requirement that concerned tribes must rely upon the ICC adjudicated map in determining their traditional areas.[94]

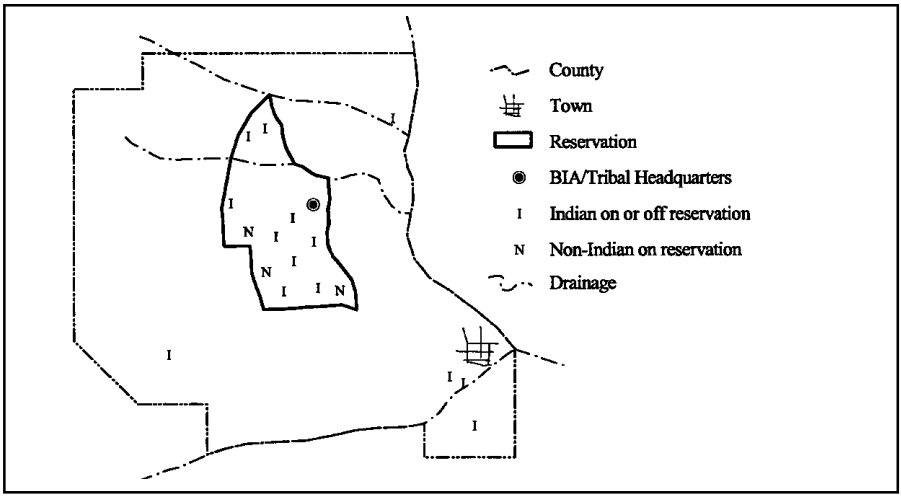
In actual practice several restorations have been established for the Havasupai, Timbisha, Taos, Yakama, Zuni, and a few others. The Havasupai land restoration sought to expand their reservation mostly in terms of potential land use; the area added failed to embrace an important sacred site. The Timbisha, who were not a party to major land claims litigation, finally negotiated an agreement with the National Park Service that restores some traditional lands within park boundaries. For both the Taos and Zuni Pueblos, land restorations focused on sacred sites—Blue Lake for the former and Kolhu/wala:wa for the latter. For the Yakama, the restoration was less a transfer of ownership than a shift of the boundary of the Mt. Adams Wilderness so that a portion of the mountain would lie within the reservation. The boundary change was conceived and published by the tribe in a tribal report.[95]

More recently, tribes such as the Hopi have entered into "partnerships" with public land agencies in order to participate in the management of former tribal lands, even lands not considered in the litigation before the ICC.[96] Both congressional acts and a presidential executive order have given some

tribes the opportunity to join with public officials in the protection of former tribal areas. Moreover, many tribes such as the Hopi and Navajo reject the publication of maps that would reveal the locations of burial grounds and other sacred sites. Some maps do appear in reports prepared by tribal preservation offices. While the cartographic issue has not been resolved, at least one study, later presented to a congressional committee, did demonstrate how one tribe justly laid claim to sacred sites within the adjudicated area of another tribe.[97]

Despite the fact that acreage has been restored to several tribes as in the Southwest and funds made available for land purchases by a few tribes such as the Catawba, Passamaquoddy, and Penobscot in the eastern United States, the fact remains that land restoration, absent a statutory endorsement, offers limited possibilities and then only to a handful of tribes. Those tribes awarded money by Congress perhaps have a greater opportunity to acquire additional trust acreage through land purchases that will receive federal blessing. If detailed maps of such potential acquisitions exist, tribal offices would now be the best source, although statistical if not cartographic data for purchased areas would likely appear in congressional hearings or in the *Federal Register*.[98]

RESERVATION AND COMMUNITY:
CONTEMPORARY CARTOGRAPHIC REPRESENTATION



MAP 8. *Map by James A. Woods.*

The Bureau of Indian Affairs (BIA) continues to serve as the chief realty office for tribal land records. The agency is quick to note that "there is no one centralized repository nor even a few sites wherein you may find cartographic resources relating to Indians or their trust lands."[99] The BIA continues to provide a wide range of cartographic services to the tribes. In 1985 and 1986, for example, the agency implemented a centralized Geographical Information System (GIS).[100] Under the Indian Self- Determination and Education Act of

1975, as well as more recent administrative and judicial decisions, many tribes have assumed greater responsibility for management of their reservations, necessitating that researchers must contact tribal offices in order to secure up-to-date mappable data.[101] Tribes must deal with numerous land use changes for which GIS technology is expected to serve them well, including urban sprawl, timber harvest, loss of range, extraction of minerals, intensive agriculture and inventory of irrigated lands, protection of wildlife habitat and biodiversity, as well as cultural resource management, which may include off-reservation sites.[102] I would add that controversy and litigation relating to non-Indian land utilization within reservation borders present additional reasons for sustaining or updating cartographic technology on many reservations. According to Bryan Marozas, the GIS coordinator for the BIA in 2000, many tribes became committed to becoming technically self-sufficient and the BIA increased efforts to transfer GIS technology to the tribes.

Tribes also enter into contracts with private companies that provide environmental and cartographic services; and tribes also maintain their own land status maps independent of those produced by the BIA. Other land agencies also participate in the data gathering, production, and maintenance of maps important to tribal land interests.[103] As the Phoenix Area Office notes, many universities hold extensive cartographic records; in their service area these include the three major Arizona university campuses as well as those in Nevada and Utah.[104] Keep in mind that the BIA and the tribes focus their attention on lands within their borders, even while the tribes reside within larger geographical places that extend beyond trust lands and their jurisdiction. Rarely do official or tribal maps extend beyond reservation boundaries to include non-Indian civil divisions in which reservations may be found. Tribes of allotted reservations, of course, are very much concerned with non-Indian ownership as well as leasing of trust lands within their borders.[105]

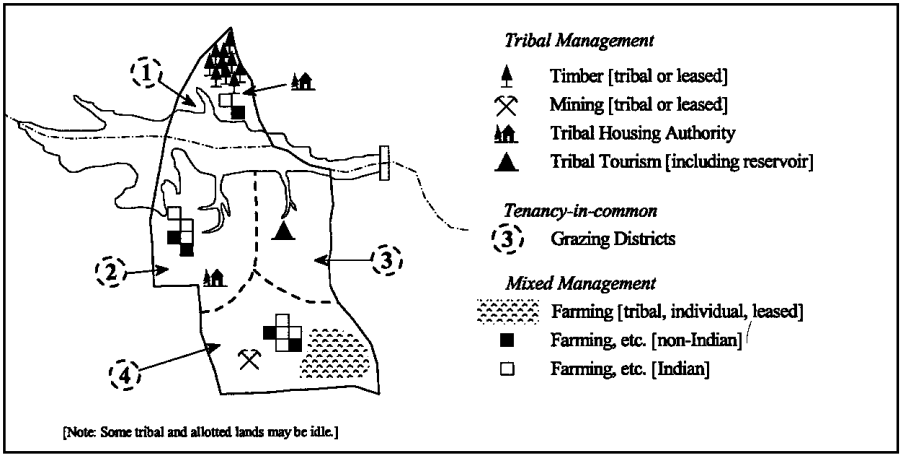
It is important to differentiate between those maps promulgated for general perusal and those designed to be "working" maps by Indian or public personnel dealing with specific land parcels, locales, or entire reservations. Personnel and researchers utilizing cadastral scale maps would be persons more qualified to scrutinize the merits of various maps. As for general maps, at least one observer offers some advice. Daniel Cole, as the GIS coordinator for the National Museum of Natural History, Smithsonian Institution, wrote in 1993 that, "A careful cartographic and geographic scrutiny of any [Indian] map frequently reveals errors and design flaws." Cole noted that errors relate to omissions and generalizations, and he identified map scale as a critical control. On reviewing the map "Indian Land Areas," he also stressed that it should not be utilized as a legal document. Despite our understanding of the purposes of such maps, he went on to note that "the map titled *Indian Land Areas* will always have the potential to instill false assumptions in the minds of untutored readers."[106] This map, of course, is derivative of a series of official maps that reveal Indian reservations across the country. But the review does remind us that just about every map of Indian lands must be evaluated before attempting to interpret it.

A more recent map, "Indian Lands of the United States,"[107] offers researchers additional information. It includes, for example, both federal and

state American Indian Reservations (AIRs), federal and state Tribal Designated Statistical Areas (TDSAs), as well as federal Tribal Jurisdiction Statistical Areas (TJSAs). The TDSAs delineate geographic areas for the 1990 Census; these areas generally contain Indian populations under tribal jurisdiction and/or for which the tribe provides benefits and services to its members. The state TDSAs are mostly found in the eastern United States, whereas only a limited amount of area—mostly in Oregon and Louisiana—is shown for federal TDSAs. The TJSAs also refer to the 1990 Census, but specifically Oklahoma, and replace the older "Historical Areas of Oklahoma."

Again, researchers should consult with tribes regarding general or more specific maps of reservations. As the BIA informs me, tribes are responsible "for operation and management of programs" and "the BIA does not provide any tribal planning or consolidation maps to the public." It is my understanding that most tribes in several regions possess "GIS tools to analyze and review digital files and coverage of their reservations." Moreover, my assumption is sustained by regional officers that researchers must contact the tribes to obtain maps.[108]

RESERVATION LAND USE AND RESOURCE MANAGEMENT



MAP 9. *Map by James A. Woods.*

Indian land utilization and resource management can be characterized as subsistent and commercial; tribal, tenant-in-common, and individual; Indian and non-Indian; and active or idle. While many individual Indians and their families farm or ranch, in many instances, allottees and/or their heirs lease their lands to non-Indians for similar uses. In some cases, Indians hire on to work for non-Indian entrepreneurs.[109] As a rule, tribes with substantial range resources organize grazing districts and associations, and land use is by tenancy-in-common or by families or outfits (a term applied to Navajo practices). A tribe or a group of Indian families distribute the range acreage among their own.[110] Tribal government arranges for the management of timber, minerals, housing, tourism, and the like. Tribes such as those of the Colorado River

Indian Reservation (in California and Arizona) or the White Mountain (Fort) Apache (in Arizona) run agricultural enterprises and/or lease tribal lands to individual Indians or non-Indians for similar ventures. It is also difficult to determine specifics for tribal administration of housing tracts under "assignment"—i.e., a more traditional way by which families build their own homes on tribal lands. The availability of map data depends upon several factors, including the existence of such map data and the willingness of tribes to permit outsiders the opportunity to examine and even copy such data. In some cases, the BIA will keep records of assigned housing areas, but it is more likely that researchers need to approach tribal realty personnel for data.

From one reservation to the next, a variable amount of land seemingly stands idle or vacant. Many allotments, because of complex heirship patterns, do remain unused or underutilized since it is difficult for any one heir to develop the parcel. On many occasions someone may have a home on the parcel, but the remaining heirs may live at a distance and even be unlocatable. Of course, the perception of idle land may be misinterpreted: much uplands may be grazed, or they may constitute part of a wilderness or park and held in tribal tenure.

As for various agricultural, ranching, tourist, wilderness, or other ventures on reservations, original maps may be based on tribal data as gathered by scholars. Such is the case for the data in maps of the Mission Mountains Tribal Wilderness (Flathead Indian Reservation, Montana), prepared by Diane Krahe. Countless master's theses and doctoral dissertations in a number of fields, including agriculture, economics, environmental studies, geography, and history, contain useful maps, many of them based on field work.[111]

When dealing with resource utilization on Indian reservations, it is not inappropriate to characterize some corporate activities as neocolonial, especially when dealing with mining and energy exploitation. For a larger environmental survey, now somewhat out of date and not including maps, see the 1986 survey by Americans for Indian Opportunity.[112]

In recent years, new technology has become available to the tribes. GIS (Geographical Information Systems) has become standard media, utilizing maps, airphotos, and other images and related computer technology in an effort to evaluate and plan land use better. This methodology has encouraged many tribes in their efforts toward indigenous planning and has become an effective means especially for environmental protection and cultural preservation as related to NAGPRA.[113] As the Phoenix Area Office reports, "[E]ssentially, only larger land-based tribes, with large resident Indian populations and more sophisticated business enterprises have in-house GIS/GPS user technology capabiltiies."[114]

While tribal data of land use enterprises may be readily available, it is more difficult to ascertain individual land use on allotted lands. In terms of mapping such land use, field observation may yield information about crops, range, and the like, but may not inform the observer about land tenure. Even cartographic data provided by BIA field offices may be more descriptive and yet not indicative of tenurial patterns. Frantz provides a good map example of landed property on the Crow Indian Reservation (in Montana). It not only

includes allotted and tribal lands, but allotments purchased by the tribe as part of a land consolidation program and "privately owned allotted land liable to taxation (partly non-Indian)." This map does not intend showing land utilization, and one can not ascertain which privately owned parcels are held by Indians and which by non-Indians.[115] Land use on allotted lands held in various tenures remains a challenge for anyone engaged in field work on Indian reservations.

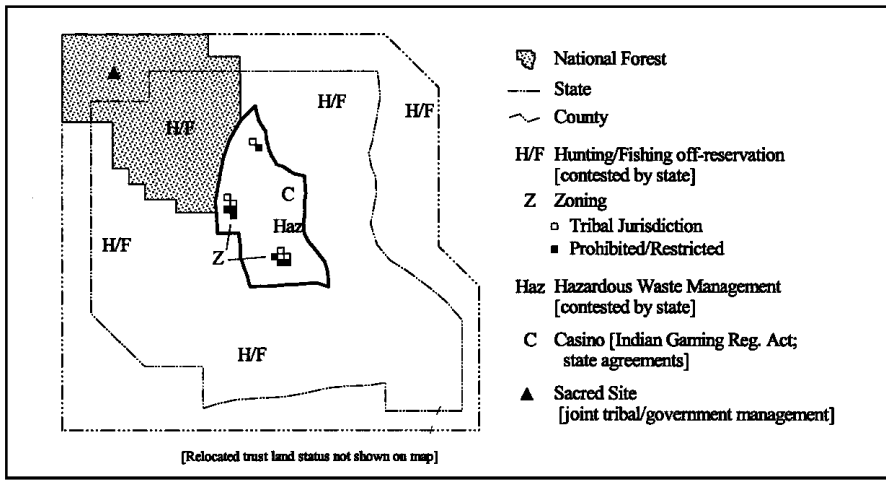
Several tribes today have expressed interest in developing land consolidation programs pursuant to the Indian Land Consolidation Act and its amendments.[116] The original act in 1982 sought to enable tribes to plan for the sale or exchange of tribal lands for fragmented holdings. Unfortunately, the Supreme Court ruled in *Hodel v. Irving*[117] that the escheat provision, allowing for holdings of less than 2 percent to revert to the tribe, was constitutional and, despite congressional revision, the problem remained unresolved.[118] However, with the assistance of the BIA many tribes continue to pursue land consolidation.[119] In fact, it is strongly encouraged by the BIA. Ultimate motives for land consolidation vary but do reflect the need to overcome the idleness of so many allotments, making some acreage available for farming, grazing, and various forms of tourism including gaming. For southwestern reservations land consolidation is of "paramount interest" to individual Indians rather than tribes. However, tribes pursuing holistic resource management are concerned about the nearly continuous problem of lands left intestate. Unallotted reservations are free of the burden of complex heirship, which prohibits or limits the utilization of thousands of acres on trust lands in the Great Plains, the Intermontane Region, and the Far West.

The amendments to the original act provide for several changes including the adoption of tribal probate codes; changes in the definition of an Indian that determine who is ineligible to inherit trust land; and significant modification of the secretary's authority to approve trust to trust conveyances. A significant modification of the law indicates that if an Indian does not write a will, a judge can only award the land to a spouse and/or family, *but only if they are Indian.* Non-Indian heirs would only receive a life estate. In 1999 the Bureau of Indian Affairs established a pilot project in their Midwest region. The intent has been for the federal government to purchase undivided interests and place title in the name of the tribe.[120] In 2002 the land consolidation program is operating on five reservations in the Great Lake states and is expected to commence on the Rosebud Indian Reservation in the Great Plains. The intent is to acquire fractional interests of 2 percent or less. According to the BIA, "The design of the program is not to effectuate trust reform but to gather data to evidence administrative cost savings to the federal government and slow the growth of fractionation." In the Great Lakes region, several Chippewa bands are being assisted by the federal purchase of undivided interests held by heirs to countless allotments. The Lac Courte Oreilles, for example, who already operate a casino, may, if we speculate a bit, hope to expand tribal resort enterprises by consolidating fragmented parcels,[121] a motive that other tribes may indeed have in mind.

Several tribes have specially purchased additional acreage in conjunction with developing or expanding gaming operations. The Berry Creek Band in

California, one of many that has acquired additional acreage, made such a purchase pursuant to the Land Consolidation Act.[122] Several tribes in New England, those that have received settlement monies from Congress, have also purchased lands, including the Aroostock Band of Micmac, the Penobscot, Passamaquoddy, and the Mashantucket Pequot, which ultimately developed Foxwoods, the largest Indian gaming center in the East.[123] Both the Crow in Montana and the Salt River in Arizona have been seeking to consolidate lands.[124]

ENVIRONMENTAL JURISDICTION



MAP 10. *Map by James A. Woods.*

In recent years case law has sought to restrict many tribes in their efforts to retain autonomy over development and utilization of resources within the external boundaries of reservations. While Washington state unsuccessfully pursued legal efforts to superimpose state environmental law over resident tribes, other litigation has terminated or abridged tribal jurisdiction over non-Indian–owned lands within reservation boundaries. While such case law identifies only specific tribes, it nonetheless raises questions about the continuing political status of non-Indian lands. Despite increases in Indian residence on reservations since 1990, litigation too often has argued successfully that Indians are not the majority residents on many reservations and that, in several instances, Indian and non-Indian demographic patterns on reservations reveal distinct geographic separation. Such were some of the conditions on Devil's Lake (in North Dakota) and Yakama (in Washington).[125] To be sure, jurisdictional issues confound all parties within given geographic areas.

Because the meaning of Indian Country enters into so much of the discussion of the cartography of Indian affairs, its needs clarification, especially since it does not appear on either official or most other maps. In legal parlance, Indian Country comprises trust lands such as reservations, allotments still held in trust by Indians, public domain Indian allotments, and miscella-

neous other parcels of land. For cartographic purposes, this legal definition identifies the fiscal responsibilities of the BIA and alerts researchers and others as to what materials, including maps, would be found in official files and archives.[126] In reality, however, this legal definition does not reach out to the political milieu in which countless interactions exist among tribes, local governments, and citizenry.

For a broader geographic interpretation, an extra-legal definition of Indian Country would embrace these nearby communities and civil divisions in which the trust lands are located.[127] While official as well as tribal maps of reservations do not depict this broader meaning of Indian Country, its significance to the autonomy of tribes should not be underestimated. Many non-Indians, for example, live and work within the external boundaries of reservations, and some tribal members live outside those bounds whether on trust or other landholdings. To some extent the largest environmental realm of Indian Country would extend to all former tribal territory and thus relate not only to political interaction with nearby towns, cities, and counties, but also to lands now held by public land agencies and private owners. This has become the setting today of much conflict and litigation between tribes and non-Indian governments and groups. Moreover, this era of Indian casinos demonstrates the validity of identifying Indian Country as embracing local civil divisions, their governments, and citizenry.

In 1953, Congress authorized several states to assume civil jurisdiction over reservations; known as PL 280, Congress later legislated a way for tribes to retrocede from the jurisdiction of states. Many states and local governments then (as now) intruded on tribal autonomy with respect to zoning, taxation, and related matters. While some legislative controls are in place diminishing state efforts to enforce its jurisdiction, state environmental statutes have worked their way into the lives and activities of tribes. As an unique example, South Dakota officially rejected original reservation boundaries and published maps that "liberate" certain counties from tribal definition. Generally, the underlying motive for refusing to recognize tribal boundaries has been to seek greater governing jurisdiction over water, wildlife, hazardous waste, and other resource management issues.[128]

There are many cases in which the tribes have litigated their sovereign rights to determine environmental protections on their lands. *Montana v. United States*[129] is an early case involving tribal regulation of fishing and hunting by nonmembers of the tribe, but the court set aside their regulations. At a later date, in *Washington Department of Ecology*,[130] the state sought to impose its environmental regulations but the courts contended that when the Environmental Protection Agency or other federal agencies are charged to administer to tribal lands, states may not intervene. It is troubling to the tribes and their champions that statutes and case law seesaw in this environmental arena. More often, however, litigation has resulted in the geographic diminishment of tribal jurisdiction as evidenced in the litigation involving the Yakama and Devil's Lake Indian reservations.[131]

Since the mid-1980s, tribes have introduced a new phenomenon—the Indian casino—into Indian Country and it has led to controversy. Indian casi-

nos exist in most states that contain trust lands. California may be the dubious leader, for tribes and bands had established more than forty casinos as of spring 2001 and others are under consideration. These casinos, like those located on reservations in most other states, conform to the regulations established by the Indian Gaming Regulatory Act of 1988.[132] California, however, represents an interesting exception because the tribes created a united front by establishing the California Indian Alliance, which financed the placement of a successful proposition on the California ballot in spring 2000. That initiative became law and paved the way for agreements between tribes (bands) and the state governor. Meanwhile, in May 2001 a northern California band of Maidu with the backing of a Nevada gaming group sought to establish a casino in Ventura County, far south of its own territory. This is not the first effort to "relocate" tribal land rights out of aboriginal territory, but it was strongly rejected by the indigenous Chumash (a branch of which runs a casino east of Solvang in neighboring Santa Barbara County to the north). Ultimately, the city of Oxnard, where the Maidu hoped to open a casino, rejected the proposal.[133]

In the larger context of Indian Country, other tribes have sought to establish casinos external to their reservations by acquiring new lands that the federal government would place in trust. Pursuant to §2719 of IGRA, for example, the Eastern Shawnee operate a bingo hall across the Oklahoma border in Seneca, Missouri. The Delaware Tribe of Oklahoma has since 1995 pursued the acquisition of land in New Jersey (parts of that state were once aboriginal territory) for the establishment of a casino.[134]

What is interesting is the idea that either a recognized or non-recognized tribe or band could seek federal support to grant *trust* status to a purchased parcel no matter where it would be located and then an Indian group could approach the state and local governments for formal consent to operate a casino. Carmichael and Peppard discuss this issue, identified as annexation, which represents an extension of tribal land tenure to new lands that would prove to possess superior location in terms of casino success. On the other hand, local communities are unreceptive to the possibilities of casino/resort expansion and hope that local and state authorities will not endorse trust status for the land, thus aborting any attempt to establish a casino. Were a city to accept and the state and federal governments willing to follow up, such casinos would likely distribute revenue to the local government as well as create significant employment opportunities. For some states, such as Connecticut, agreements with tribes may yield annual revenue for the state. This is true of the Mashantucket Pequot, whose casino Foxwoods is located near Ledyard.[135]

Land acquisition based on revenues derived from gaming may relate to the expansion of gaming or other operations. For example, both the Barona and Pechanga bands in Southern California are developing hotel resorts adjacent to casinos; the latter has acquired additional land for this venture. On the other hand, the Tiguas, in western Texas, have utilized lucrative income from gaming to purchase sizeable acreage outside their historical range as a tribal hunting area.[136] Regardless of the motive for such purchases and because of the newness of these events, it is unfortunate that map data may

be lacking or only available through willing tribes. Moreover, no single map has attempted to show the extent of Indian casino operations in the United States, and there is no good cartographic representation of acquired lands based on gaming or other tribal income.

Since Indian gaming involves state and local endorsement and has important environmental implications—traffic congestion, for example—as well as social concerns, such as alleged increased criminal activities, it logically represents an important concern to states and local civil divisions despite the protections of tribal autonomy enacted into federal law.

COMMENTARY

Other approaches to the cartography of Indian affairs would of necessity draw upon many of the same sources, as well as others. Discussions would be organized in a different manner, thus reaching some different conclusions. My approach does not intend to be innovative or definitive, but rather has sought to provide new and uninitiated researchers with a scheme that pulls together relevant map sources and offers some critical interpretation of cartographic utility. Obviously, in most categories I have not provided an exhaustive list but have chosen to suggest titles in various categories: manuscripts, books, articles, documents, and maps as individual items. It can be asserted that for the earlier periods in Indian affairs—e.g., treaties of cessation, reservation, and land allotment—map records abound, although a number of them are less than accurate and subject to diverse interpretations. As for land use and resource management and such matters as land consolidation, tribal offices may now be the only available source for contemporary maps.[137] As for aboriginal territoriality, its mappable link to land claims will continue to raise questions about the acceptability of judicially established claims areas as rendered by the ICC. Consequently, efforts at land restoration and so-called partnership schemes will depend heavily upon tribal accord with federal and other land agencies. Where public lands are involved, it is likely some preliminary maps may become available, but whenever tribes are seeking to protect burial grounds and other sacred places, they become reluctant to promulgate mappable data. Treaty rights with respect to fisheries, hunting areas, and watersheds still remain less than mappable as subject matter, but as we have seen, such agencies as the Columbia River Inter-Tribal Commission have provided important cartographic exhibits.

Geographical issues that commit tribes to litigation—environmental conflicts with states and local civil divisions, to name one—await cartographic renderings and possible later publication. We have seen that such conflicts erupt not only within the bounds of reservations, but also within traditional tribal lands that today form part of the managed properties of public agencies or private owners. The fact is the courts have been diminishing tribal jurisdiction within reservations—the Yakama "closed" and "open" areas, for example—even as Congress and the president have mandated that public land agencies enter into management partnerships with the tribes whose former lands represent "judicially established" areas by decree of the ICC.[138]

As a final thought, an entirely new group of maps (and concomitant photos) dealing with Indian trust lands will result from the exploitation of GIS and indigenous planning. Tribes will increasingly provide their own maps with or without the assistance of other organizations or agencies. And researchers will ultimately need to turn to the tribes for data and advice.[139]

ACKNOWLEDGMENTS

The documentation for this study constitutes much less than what is available in manuscript or print; citations suggest the type of materials available and the scope of research in given subject areas. For general encouragement and a reading of some parts of this study, I wish to thank Nancy O. Lurie, curator emeritus of anthropology, Milwaukee Public Museum; David Wishart, professor of geography, University of Nebraska, Lincoln; and Daniel J. Gelo, professor and chair of anthropology, University of Texas, San Antonio. I am also grateful for the instructive advice and data from Bryan Marozas, formerly GIS coordinator, Bureau of Indian Affairs, now of the Office of Indian Trust Transition in Albuquerque, and the responses to my letter requests from the Rocky Mountain Regional Office, and the Portland and Phoenix Area Offices of the BIA. John Philbin's lengthy and detailed answers from the Phoenix office made it possible to discuss the cartographic work of the BIA and other agencies more fully. The additional responses by Danielle P. Dutt of the Portland office are also much appreciated. I also want to thank my anonymous referees for making useful suggestions about reorganization and expansion of the discussion of Indian gaming and land consolidation. Finally, I wish to acknowledge with appreciation and thanks the skills of James A. Woods, instructor in cartography, California State University, Long Beach, whose computer-cartographic renderings of my map schemes much enhance this article.

NOTES

1. Laura E. Kelsay, comp., *Cartographic Records in the National Archives Relating to Indians in the United States,* National Archives and Research in Historical Geography (Washington, DC: National Archives, 1971); and id., *List of Cartographic Records of the Bureau of Indian Affairs,* Special List 13 (Washington, DC: National Archives, 1954). Cf. Francis P. Prucha, *A Bibliographical Guide to the History of Indian-White Relations in the United States* (Chicago: University of Chicago Press, 1977), 20, entries 191–197. For a broader discussion see Imre Sutton, *Indian Land Tenure: Bibliographical Essays and a Guide to the Literature* (New York: Clearwater Publications, 1975), *passim* and 218–219. The largest number of maps in historic volumes is derivative; some are reproductions of earlier, more empirical maps. One needs to identify original sources for such maps. For example, on the inside cover of Douglas Summers Brown, *The Catawba Nation: The People of the River* (Columbia: University of South Carolina Press, 1966) appears a photocopy of a map by Henry Mouzon et al. entitled "An Accurate Map of North and South Carolina with Their Indian Frontiers," 1778. This map exhibits a 144,000-acre tract belonging to the Catawba Indians at the time. See John C. Christie Jr., "The Catawba Indian Land Claim: A Giant among Indian Land Claims," *American Indian*

Culture and Research Journal 24, number 1 (2000): 173–182, esp. fig. 3, p. 175. I made use of photocopies of two original maps—DeSmet's "Map of Western United States, 1851," and "The Doty Map" of Shoshone Territory, 1863. The former is housed with the Library of Congress and the latter is found in the National Archives, RG 75, Map CA248 (see Imre Sutton, ed., *Irredeemable America: The Indians' Estate and Land Claims* [Albuquerque: University of New Mexico, 1985], frontispiece, p. xiii, and figure 8.2, p. 194. For an extensive listing of relevant geographic studies, many of which contain maps, see Stephen C. Jett, comp., *A Bibliography of North American Geographers' Works on Native Americans North of Mexico, 1971–1991*, Haskell Indian Nations University Studies in the Geography of the American Indian 1 (Lawrence, Kansas: Haskell Indian Nations University, 1994).

There is no better place to cite William C. Sturtevant, general ed., *Handbook of North American Indians* (Washington, DC: Smithsonian Institution, various years). If we consider just one volume, *Great Basin*, ed. Warren L. D'Azevedo (1986), we find a quantum of maps, including many related to prehistory, others dealing with specific tribal groups, treaties, and reservations. For such maps, many are original compilations for the volume, others are derivative of other sources. To some degree one will find a cross-section of useful maps in encyclopedic volumes such as Duane Champagne, ed., *The Native North American Almanac* (Detroit: Gale Research Inc., 1994, 2001) and in Mary B. Davis, ed., *Native America in the Twentieth Century: An Encyclopedia* (New York: Garland Publishing Company, 1994). Most of these maps are derivative of other sources, such as maps of land claims adjudication and general maps of reservations and other trust lands.

2. Of the original plats surveyed and drawn for Southern California from 1857 into the 1880s, for example, an inestimable number were lost as a result of the 1906 earthquake in San Francisco, where the maps were stored. These and later plats contained site locations of Indian communities and were important sources for the establishment of reservations for the Mission Indians up to 1892. See Imre Sutton, "Land Tenure and Changing Occupance on Indian Reservations in Southern California," (Ph.D. diss., University of California, Los Angeles, 1964), available via University Microfilms International, Ann Arbor, MI, #65-4706.

3. The chief historic source continues to be Charles C. Royce, comp., *Indian Land Cessions in the United States, 18th Annual Report, 1896–97,* part 2 (Washington, DC: Bureau of American Ethnography, 1899), 521–997. No one to date has challenged most of the maps in this volume. I raised questions about the accuracy of cession boundaries for Southern California; and Robert P. Swierenga, *Pioneers and Profits: Land Speculation on the Iowa Frontier* (Ames: Iowa State University Press, 1968), p. 18, noted inconsistencies in the delineation of Sac and Fox country. Robert F. Heizer, "Treaties," in *Handbook of North American Indians,* vol. 8, ed. R. F. Heizer (Washington, DC: Smithsonian Institution, 1978) observed of the land cessions map of California in Royce that there was no basis for their delineation other than the vague impression of the Senate that California Indians were willing to cede most of the lands. "Royce's map is, therefore, his own artifact deriving from the same assumption" (p. 703).

4. The Garland Publishing Company's volumes of the claims cases include useful maps that at times have been poorly reproduced from court exhibits and archival sources. Many of these maps owe their origin to compilations prepared by expert witnesses, and originals are housed either with appropriate federal offices and archives or

with the tribes. Cf. Sutton, *Irredeemable America,* esp. chapter 5, "Configurations of Land Claims: Toward a Model," 111–132.

5. See, for example, E. Richard Hart, ed., *Zuni and the Courts: A Struggle for Sovereign Land Rights* (Lawrence: University Press of Kansas, 1995): figs. 10.1–10.7. I have in my possession a map—"Areas of Zuni Land Taken Since 1846," prepared by Bryan Marozas—that compiles all the Zuni claim areas on one map. The map was prepared for the plaintiff tribe in *Zuni Tribe of New Mexico v. US* by Environmental Systems Research Institute, Redlands, California (circa 1987). It has a scale of 1 inch=8 miles and the map size measures 42 inches X 24 inches, suggesting the need for a large area to depict the detail on a single map. Generally, as part of land claims exhibits, plaintiff tribes and the US defendant introduced multiple maps.

6. Royce, *Indian Land Cessions.* See more discussion under schematic map 6. US Congress, House of Representatives, *Report with Respect to the House Resolution Authorizing the Committee on Interior and Insular Affairs to Conduct an Investigation of the Bureau of Indian Affairs*, House Report 2503, 82nd Cong., 2nd Session (Washington, DC: Government Printing Office, 1953). Alfred L. Kroeber, *Natural and Cultural Areas of Native America,* University of California Publications in American Archaeology and Ethnology 38 (Berkeley: University of California Press, 1939). Readers should turn to the Kelsay guides to locate various older maps by tribe or subject.

7. T. J. Ferguson and E. Richard Hart, *A Zuni Atlas* (Norman: University of Oklahoma Press, 1985). See my review, *Geographical Review* 77, number 3 (1987): 239–240.

8. James M. Goodman, *The Navajo Atlas: Environments, Resources, People and History of the Diné Bikeyah* (Norman: University of Oklahoma Press, 1982). Cf. "Aboriginal Navajo Land," fig. 1, in Philip Reno, *Navajo Resources and Economic Development* (Albuquerque: University of New Mexico Press, 1983). The Reno map is based on data from the Navajo Land Findings of Fact. For a different presentation of the Hopi-Navajo land dispute, one that also shows potential new Hopi lands as well as Hopi lands to be leased to Navajos, see Martin Ira Glassner, *Political Geography*, Second Edition (New York: John Wiley and Sons, 1996), chapter 16, "Indigenous Peoples," 212–229 (map p. 227). For my review of Goodman, see *Geographical Review* 73, number 4 (1983): 450–451.

9. Jeff Zucker, Kay Hummel, and Bob Høgfoss, *Oregon Indians: Culture, History and Current Affairs* (Portland, OR: Western Imprints, Press of the Oregon Historical Society, 1983), 80, 83, 92, 94, and 124.

10. Helen Hornbeck Tanner, ed., *Atlas of Great Lakes Indian History* (Norman: University of Oklahoma Press for the Newberry Library, 1987).

11. Francis P. Prucha, *Atlas of American Indian Affairs* (Lincoln: University of Nebraska Press, 1990). See my review, *American Indian Culture and Research Journal* 15, number 2 (1991): 231–232.

12. Samuel W. Crompton, general editor, *Illustrated Atlas of Native American History* (Edison, NJ: Chartwell Books, 1999), 6.

13. Pierluigi Portinaro and Franco Knirsch, *The Cartography of North America, 1500–1800* (Edison, NJ: Chartwell Books, Inc, 1987).

14. For example, there is one by Carl Waldman and Molly Braun, *Atlas of the North American Indian* (New York: Facts on File, 1986), which is largely derivative of other sources yet a useful reference. See my review of the first edition, *Geographical Review* 76, number 3 (1986): 330–332.

15. For example, Warren A. Beck and Ynez D. Haase, *Historical Atlas of the American*

West (Norman: University of Oklahoma Press, 1989), maps 51 and 52 show Indian lands and judicially established areas. Henry P. Walker and Don Bufkin, *Historical Atlas of Arizona* (Norman: University of Okahoma Press, 1979) includes Indian tribes circa 1600 (map 12) and circa 1860 (map 24); the development of Indian reservations (maps 42, 43), specifically of Apache, Hopi, and Navajo (map 44); and for the whole state (map 45). Beck and Haase, *Historical Atlas of California* (Norman: University of Oklahoma Press, 1974) similarly offers Native Groups 1770 (map 11) and Indian lands (maps 57 and 58). Thomas J. Noel, Paul E. Mahoney, and Richard E. Stevens, *Historical Atlas of Colorado* (Norman: University of Oklahoma Press, 1994) includes a boundaries section but none of the maps focus on Indian tribes. The settlement section does include maps of prehistoric Coloradans, Anasazi, Fremont, and Plains Culture, and Native American Tribes (maps 43–45). Map 45 does include land cessions. There are no maps of Native territoriality or land claims adjudication. Jerry L. Williams and Paul E. Mcallister, *New Mexico in Maps* (Albuquerque: University of New Mexico Press, 1981) includes as part of Historical Landscapes a map (p. 27) revealing paleo-Indian sites, Native American settlements (p. 29). In contrast, Beck and Haase, *Historical Atlas of New Mexico* (Norman: University of Oklahoma Press, 1969) includes several useful maps—prehistoric civilizations (map 12), Pueblos and nomadic tribes, 1541 (map 15), nomadic tribes circa 1845 (map 22), Indian tribal lands (map 56), and present Indian Pueblo towns (map 57). John W. Morris, Charles R. Goins, and Edwin C. McReynolds, *Historical Atlas of Oklahoma,* Third Edition (Norman: University of Oklahoma Press, 1986) updates from the 1980 Census. Thus far, this is the most comprehensive Indian atlas, revealing homelands, removal of the Five Tribes, maps specific to Choctaw, Cherokee, Creek, Chickasaw, Seminole, Osage, and smaller groups, as well as Cheyenne and Arapaho leased and allotted lands. Several maps of evolving Indian Territory are included besides one of the proposed state of Sequoyah. A. Ray Stephens and William M. Holmes, *Historical Atlas of Texas* (Norman: University of Oklahoma Press, 1989) includes a map of Texas Indians (map 7) and Indian reservations in the 1850s (map 36). James W. Scott and Roland L. De Lorme, *Historical Atlas of Washington* (Norman: University of Oklahoma Press, 1988) includes a section on Indian history showing tribal distributions and Indian reservations; the atlas doesn't include adjudicated claims areas or other Indian territorial maps.

Some of these historic atlases have been utilized for other maps of tribes and lands. See for example: Faiman-Silva, *Choctaws at the Crossroads: The Political Economy of Class and Culture in the Oklahoma Timber Region* (Lincoln: University of Nebraska Press, 1997), figs. 2.1 and 4.1, as partially based on Morris, Goins, and McReynolds, *Historical Atlas of Oklahoma*; Winona LaDuke, *All Our Relations: Native Struggles for Land and Life* (Cambridge: South End Press, 1999), "The Seventh Generation of Ojibwe Ceded Lands," as based on *Wisconsin's Past and Present: A Historical Atlas* (Madison: University of Wisconsin Press, 1998), 196.

16. David J. Wishart in *An Unspeakable Sadness: The Dispossession of the Nebraska Indians* (Lincoln: University of Nebraska Press, 1994). His maps also reflect the utility of land surveys and ethnographic and historic/documentary maps (e.g., "Auguste Chouteau's Map of Indian Territories, 1816," fig. 3, and "DePuy's Map of the Pawnee Reservation, 1861" redrawn, fig. 22). Lawrence M. Hauptman, *Conspiracy of Interests: Iroquois Dispossession and the Rise of New York State* (Syracuse: Syracuse University Press, 1999).

17. Klaus Frantz, *Indian Reservations in the United States: Territory, Sovereignty, and*

Socioeconomic Change, Geography Research Paper 242 (Chicago: University of Chicago Press, 1999), figs. 3.5, 3.11, and 3.12; Royce, *Indian Land Cessions*; other sources include Kroeber, *Natural and Cultural Areas,* and Sam B. Hilliard, "Indian Land Cessions" (map supplement), *Annals Association of American Geographers* 62, number 2 (l972). My earlier models may be found in Imre Sutton, "Sovereign States and the Changing Definition of the Indian Reservation," *Geographical Review* 66, number 3 (1976): 281–295 and id., "Preface to Indian Country: Geography and Law," *American Indian Culture and Research Journal* 15, number 2 (1991): 3–35.

18. In this study, no attempt has been made to classify maps; however, in 1988 I did publish a typology that includes archaeological, ethnographic, historic/documentary, and environmental maps. I noted then that we could also classify maps by methods of preparation—e.g., field reconnaissance, geodetic survey, and ethnohistoric reconstruction. Many of the maps discussed in this reference study do fit into either scheme. See Imre Sutton, "The Cartographic Factor in Indian Land Tenure: Some Examples from Southern California," *American Indian Culture and Research Journal* 12, number 2 (1988): 53–80, ref. to p. 54. That study included a surveyor's plat of 1857; an ethnohistoric reconstruction utilizing an earlier map with additional data added; a reserved and ceded lands map based mostly on Royce, *Indian Land Cessions,* hence mostly historic/documentary; a map of land assignments based on field work and BIA office records; and a composite map showing data based on executive orders, Royce, and other historic data, and utilized in a land claims case *Pechanga v. Kacor et al.* See John C. Christie Jr., "Indian Land Claims Involving Private Owners of Land: A Lawyer's Perspective, in Sutton, ed., *Irredeemable America,* chap. 10, 233–246.

19. Kroeber, *Natural and Cultural Areas*; Robert F. Heizer, *Languages, Territories and Names of California Indian Tribes* (Berkeley: University of California Press, 1966); and my review in *Professional Geographer* 20, number 1 (1966): 75–76. Cf. William C. Sturtevant, "Early Indian Tribes, Culture Areas, and Linguistic Stocks" (map), in *The National Atlas of the United States of America* (Washington, DC: Geological Survey, 1970). Other sources include those by Charles F. Voegelin and Erminie W. Voegelin, *Map of North American Indian Languages,* Publ. 20, American Ethnological Society (Menasha, WI: G. Banta, 1944); Harold E. Driver et al., *Indian Tribes of North America,* Indiana University Publications in Anthropology and Linguistics, Memoir 9 (Bloomington: Indiana University Press, 1953).

Perhaps one of the more intriguing volumes that includes interesting maps is William Christie Macleod, *The American Indian Frontier* (New York: Alfred A. Knopf, 1928). Among his maps are "The Iroquois and the Great Confederations of the Old Southwest" (map 2); "The Tribes of the Old Northwest, and Their Algonkian Kin" (map 9); and "The Tribes of the Southwestern Plains, Desert, and Great Basin" (map 12). Macleod also includes Appendix X, which discusses his maps. Macleod's maps are not cartographically high quality, yet offer some interesting interpretations of available data. Note that most of his publications were ethnographical or historical in the Indian field, yet he was a professor in the Department of Finance in the Wharton and Graduate Schools of the University of Pennsylvania.

20. See Robert Rundstrom, "The Role of Ethics, Mapping, and the Meaning of Place in Relations Between Indians and Whites in the United States," *Cartographica* 30, number 1, monograph 44 (Spring 1993): 21–28; id., "Mapping, Postmodernism, Indigenous People and the Changing Direction of North American Cartography,"

Cartographica 28, number 2 (Summer 1991): 1–12, quote p. 4.

21. Mark Warhus, *Another America: Native American Maps and the History of Our Land* (New York: St. Martin's Press, 1997), 3.

22. G. Malcolm Lewis, "Indian Maps: Their Place in the History of Plains Cartography," in *Mapping the North American Plains*, eds. Frederick C. Luebke, Francis W. Kaye, and Gary E. Moulton (Norman: University of Oklahoma Press in association with the Center for Great Plains Studies, University of Nebraska, Lincoln, 1987), 63–80; and Lewis, "Misinterpretation of Amerindian Information as a Source of Error on EuroAmerican Maps," *Annals Association of American Geographers* 77, number 4 (1987): 542–563. See also Lewis, ed., *Cartographic Encounters: Perspectives on Native American Mapmaking and Map Use* (Chicago: University of Chicago Press, 1998) and its review by Robert Rundstrom, *Professional Geographer* (May 2001): 292.

23. Correspondence between the author and Daniel J. Gelo, professor of anthropology, University of Texas, San Antonio, April 17, 2001. Cf. Gelo, "'Comanche Land and Ever Has Been': A Native Geography of the Nineteenth-Century Comanchería," *Southwestern Historical Quarterly* 103, number 3 (January 2000): 273–307. It is suggested to me that Gelo might have in mind a functional region, not unlike that proposed by Donald Meinig in his "core/domain/sphere" approach to the Mormon culture region and to Texas. For comparative interpretation, see Meinig, "The Mormon Culture Region: Strategies and Patterns in the Geography of the American West, 1847–1964," *Annals Association of American Geographers* 55 (1965): 191–220; and David J. Wishart, "The Dispossession of the Pawnee," *Annals Association of American Geographers* 69 (1979): 382–401.

24. Daniel Gelo is referring to Steven M. Schnell, "The Kiowa Homeland in Oklahoma," *The Geographical Review* 90, number 2 (April 2000): 155–176. Gelo, correspondence, April 17, 2001.

25. Sally Fairfax, "Managing Place and Identity: Establishing Boundaries," manuscript refereed by me for *The Geographical Review* (fall 2000).

26. Louis De Vorsey Jr., *The Indian Boundary in the Southern Colonies, 1763–1775* (Chapel Hill: University of North Carolina Press, 1966). See also De Vorsey, "Early Maps as a Source in the Reconstruction of Southern Indian Landscapes," in *Symposium on Indians in the Old South: Red, White, and Black*, ed. C. M. Hudson (Athens: Southern Anthropological Society, 1971); and id., "Historical Maps before the United States Supreme Court," *Map Collector* 19 (June 1982): 24–31. De Vorsey also served as an expert witness for cartographic data on early maps before the US Supreme Court.

27. William C. Sturtevant, "Early Indian Tribes, Culture Areas, and Linguistic Stocks," *National Atlas* (Washington, DC: US Geological Survey, 1983); map scale: 1:7,500,000, approximately 125 miles=1 inch. "Indians of North America," (Washington, DC: National Geographic Society, 1972), supplement to vol. 142, n. 6, p. 739a; map scale: 1:10,610,000, approximately 167 miles=1 inch. Of maps of a single state, see "Indian Tribes and Languages of the Old Oregon Country" (Portland, OR: Oregon Historical Society, 1959); map scale 1:1,562,000, approximately 25 miles=1 inch. This map is based upon the same cultural criteria as the others although some boundaries are not the same.

28. Royce, *Indian Land Cessions*; see also Hilliard, "Indian Land Cessions." Hilliard's fold-out map presents Royce's land cession data in a series of five maps spanning various dates: 1784–1819, 1820–1839, 1840–1859, 1860–1879, and 1880–1972,

and utilizing five color gradients on each map. To date, these maps represent the best reconstruction of Royce's data. These maps also reflect reliance on the compendious volumes by Charles J. Kappler, *Indian Affairs: Law and Treaties,* 5 volumes (Washington, DC: Government Printing Office, 1903–1938). See my review of the Hilliard map, *Pacific Historical Review* 42, number 1 (1973): 108. For a more typical historical use of cartographic sources that utilizes Royce as well as John R. Swanton's *Indian Tribes of North America*, Bulletin 145 (Washington, DC: Bureau of American Ethnography, 1952) in a series of treaty of land cessions maps that also include original territories, see Donald E. Worcester, ed., *Forked Tongues and Broken Treaties* (Caldwell, ID: The Caxton Printers, Ltd., 1975). These maps include lands of the Choctaw, Cherokee, Sioux, and Apache. The maps were prepared by the Northwest Cartographic Institute.

29. On recognized title compared to original (Indian) title, see Richard W. Yarborough, commissioner, ICC, "Index to the Map Indian Land Areas Judicially Established," *Final Report*, US Indian Claims Commission (Washington, DC: Government Printing Office, 1979): 127–130.

30. See my discussion of executive order changes in Sutton, *Indian Land Tenure, passim.* Cf. Hart, *Zuni and the Courts*, which reconstructs in stages the reduction of the Zuni Indian Reservation by land cessions. Similarly, Goodman, *The Navajo Atlas,* exhibits a series of maps showing land cessions and additions to the Navajo Indian Reservation. As an example of the utility of certain early maps, note in the establishment of a reservation for the Pima and Maricopa Indians in central Arizona, Malcolm Comeaux, a geographer, includes maps based on Captain Adna Chaffee from Arizona Territory 1878, another entitled "Sketch of a portion of Salt River . . ." accompanying Chaffee's report, two that include data from executive orders. All of these maps are historic/documentary and include field reconnaissance and other means. Comeaux, "Creating Indian Lands: the Boundary of the Salt River Indian Community," *Journal of Historical Geography* 17, number 3 (1991): 241–256.

31. I have made use of a copy of "Township No. X (10) South, Range No. I (1) East" (San Bernardino Meridian, 1:125,000, or 1 mile=2 inches). This comprises a portion of the northern area of San Diego County, California. The plat is dated March 21, 1857. It reveals Indian villages, barley fields, and wagon roads. For comparison, consider the photocopy of a plat "Township No. IV (4) South, Range No. IV (1) East" (San Bernardino Meridian), dated Feb. 15, 1901. Written on the plat it says: "Recd [*sic*] with letter of March 4, 1856. . . ." The General Land Office certified its "true and literal exemplification of the township plat. . . ." It reveals Indian houses and fields and the site of hot springs (Sec. 14) in the area that is today Palm Springs, California. To date, no one has reexamined treaties of land cession toward realizing a different interpretation of the data. My rendering of plat T10S, R1E dated 1857 (fig. 3.1) has been reproduced in Sutton, "The Cartographic Factor . . ."; on it, I superimposed the bounds of the Cuca Rancho which lies within the La Jolla Indian Reservation, which was established by 1875. In this same article, I also reconstructed the land tenure history of the Pechanga Indian Reservation, revealing parcels claimed by the band but excluded by executive order because of bona fide homestead entries (fig. 3.5). Such demonstrates how agencies did not confer on official land transactions.

32. For example, see Sam B. Hilliard, "Indian Land Cessions West of the Mississippi," *Journal of the West* 10, number 3 (1971): 493–510; Ronald A. Janke, "The Loss of Indian Lands in Wisconsin, Montana and Arizona," in *A Cultural Geography of*

North American Indians, eds. Thomas E. Ross and Tyrel G. Moore (Boulder: Westview Press, 1987), 127–148; and id., "Chippewa Land Losses," *Journal of Cultural Geography* 2, number 2 (Spring/Summer 1982): 84–100; Janke's maps of Chippewa land cessions credit Kappler, but he acknowledges Royce, *Indian Land Cessions*, in his notes. For the wording of treaties, see Charles J. Kappler, *Indian Affairs, Laws and Treaties*, 5 volumes (Washington, DC: Government Printing Office, 1903–1938). Cf. my discussion in *Indian Land Tenure,* 51–55. On the subject of treaties, see Vine Deloria Jr. and David E. Wilkins, *Tribes, Treaties, and Constitutional Tribulations* (Austin: University of Texas Press, 1999) and Francis Paul Prucha, *American Indian Treaties: The History of a Political Anomaly* (Berkeley: University of California Press, 1994). Cf. Prucha's chapter 12, "The End of Treaty Making."

33. See Wilcomb E. Washburn, *The Assault on Indian Tribalism: The General Allotment Law (Dawes Act) of 1887,* The America's Alternatives Series (New York: J. B. Lippincott Company, 1975). Leonard A. Carlson, *Indians, Bureaucrats, and Land: The Dawes Act and the Decline of Indian Farming* (Westport, CT: Greenwood Press, 1981); Janet A. McDonnell, *The Dispossession of the American Indian: 1887–1934* (Bloomington: Indiana University Press, 1991). Unfortunately, neither of these volumes provide useful maps of land allotment. Carlson includes a general allotment map for the reservations of the Northern Plains (p. 63) as based on the *Annual Reports of the Commissioner of Indian Affairs.* Considering the time frame of McDonnell's study, we could have hoped for more detail for some reservations, rather than a generalized western map, dated 1935, which poorly and less accurately shows "allocated" (allotted?), "tribally owned," and "open area." Here, *open* connotes land available under public land entry laws.

34. Harold Hoffmeister, "The Consolidated Ute Indian Reservation," *The Geographical Review* 35, number 4 (1945): 601–623. See also, for a wide spectrum of interpretations, Imre Sutton, "Private Property in Land among Reservation Indians in Southern California," *Yearbook, Association of Pacific Coast Geographers* 29 (1967): 69–89; Holly Youngbear-Tibbetts, "Without Due Process: The Alienation of Individual Trust Allotments of the White Earth Anishinaabeg," *American Indian Culture and Research Journal* 15, number 2 (1991): 93–138, esp. figs. 2, 3, 4, and 5; Jack Hunt, "Land Tenure and Economic Development of the Warm Springs Indian Reservation," *Journal of the West* 9, number 1 (January 1970): 93–109, fig. 2 (p. 97); and Frantz, *Indian Reservations,* fig. 3.7 of land tenure on the Crow Indian Reservation based on BIA Area Realty Office in Aberdeen. For a study by a non-geographer, see LaDuke, *All Our Relations,* map of White Earth Indian Reservation, 114.

35. "Blackfoot Quadrangle, Idaho" (1978), map scale: 1:100,000; "Lodge Grass, Montana-Wyoming" (1980), same map scale; neither map indicates whether the BIA made any specific input in the compilations. "Palm Springs, California" (1978), same map scale. Note that *Blackfoot* is correct although in the United States we generally refer to the tribe as *Blackfeet.*

36. "State of Utah," (1977), map scale: 1:500,000.

37. Rosebud Sioux Tribe, "Hunting Regulations and Ownership Map," Department of Natural Resources, Rosebud, South Dakota, n.d., map scale: approximately 10 miles=4.2 inches. As reported in the mid-1990s, Rosebud contained 954,572 acres, of which 409,321 were tribally held. See *Tiller's Guide to Indian Country: Economic Profiles of American Indian Reservations,* ed. and comp. Veronica E. Velarde Tiller (Albuquerque: BowArrow Publishing Company, 1996), 561. For its approximate date,

this would constitute a useful research map. The casino is about thirty-five miles north of Valentine, a fishing resort in Nebraska. For a discussion of counties in and out of the Rosebud Indian Reservation, see Sutton, "Sovereign States." Researchers will find reference to tribal sources in the credits to various maps, but there is no index to such sources. Cf. Sandra Faiman-Silva, *Choctaws at the Crossroads: The Political Economy of Class and Culture in the Oklahoma Timber Region* (Lincoln: University of Nebraska Press, 1997), map 8.1, showing current boundaries, towns, and forest concentrations as adapted from the *Comprehensive Plan of the Choctaw Nation*. "The Story of the Palm Springs Reservation," Palm Springs: Agua Caliente Band of Cahuilla Indians, n.d., map scale: approximately 2 miles=1 inch. This is not in any way a suitable research source. Cf. Imre Sutton, "Land Tenure and Occupance Change," 139–143; fig. 23, "Land Allotment"; 220–226; and fig. 42, "Alienation and Leasing [on the Agua Caliente Indian Reservation, circa 1961–1962]." These maps were prepared by me at the field office of the tribe in Palm Springs.

38. Sutton, "Sovereign States." See also Beth R. Ritter, "Dispossession to Diminishment: The Yankton Sioux Reservation" (Ph.D. diss., University of Nebraska, Lincoln, 1999).

39. Cf. Glenn A. Phelps, "Mr. Gerry Goes to Arizona: Electoral Geography and Voting Rights in Navajo Country," *American Indian Culture and Research Journal* 15, number 2 (1991): 63–92. Some years ago, the Arizona Legislature sought to enact the creation of an all-Indian county, but this bill was vetoed by the governor.

40. Sutton, *Indian Land Tenure,* 138–141 and fig. 4, "Indian Reservations in the United States, 1974," which includes then-terminated trust lands. One or more scholars contend that termination came in anticipation of the land claims litigation process. Cf. Clayton R. Koppes, "From New Deal to Termination: Liberalism and Indian Policy, 1933–1953," *Pacific Historical Review* 46, number 4 (1977): 543–566. The Klamath Indians of Oregon sold off some acreage and retained a smaller area held in common by the Indian community. The Menominee, unlike the Klamath, were later restored to trust status, but considerable tribal acreage was sold out of trust. Again, the Menominee Nation would be the best source for an appropriate map.

41. On the effects of allotment on heirship, see Michael L. Lawson, "The Fractionated Estate: The Problem of American Indian Heirship," *South Dakota History* 21 (Spring 1991): 1–42. Cf. Elizabeth Thompson, "*Babbitt v. Youpee:* Allotment and the Continuing Loss of Native American Property and Rights to Devise," *University of Hawaii Law Review* 19, number 1 (1997): 265–310. Examples of maps showing tribal and allotted lands include Donald J. Ballas, "A Cultural Geography of Todd County, South Dakota, and the Rosebud Sioux Indian Reservation" (Ph.D. diss., University of Nebraska, Lincoln, 1970). Ballas's maps also reveal lands held in the tribal land enterprise program, which was one tribe's attempt to consolidate and utilize fragmented holdings. Cf. Richmond L. Clow, "The Rosebud Tribe and the Creation of TLE, 1943–1955: A Case of Tribal Heirship Land Management," in *Trusteeship in Change: Toward Tribal Autonomy in Resource Management*, eds. Richmond L. Clow and Imre Sutton (Boulder: University Press of Colorado, 2001), chapter 6. I also produced detailed allotment and heirship maps in Sutton, "Land Tenure and Occupance Change."

42. See Imre Sutton, "Not All Aboriginal Territory is Truly Irredeemable," *American Indian Culture and Research Journal* 24, number 1 (2000): 149–150, and

Michelle M. Lindo, "*Youpee v. Babbitt*—The Indian Land Inheritance Problem Revisited," *American Indian Law Review* 22, number 1 (1997): 223–246. Clow, "The Rosebud Tribe." The Land Consolidation Act is cited as 25 *US Code,* §2206 (1994) and as amended, 25 *USCA,* §2201; PL 106-462 (2000). The Comanche reference comes from a letter to me (May 17, 2001) by Professor Daniel J. Gelo, Department of Anthropology, University of Texas, San Antonio.

43. A thorough review of the Missouri Valley tribes is provided by Michael L. Lawson, *The Dammed Indians: The Pick-Sloan Plan and the Missouri River Sioux, 1944–1980* (Norman: University of Oklahoma Press, 1982).

44. Katherine Weist, "For the Public Good: Native Americans, Hydroelectric Dams, and the Iron Triangle," in Clow and Sutton, eds., *Trusteeship in Change,* chapter 3. This study includes two maps based on Army Corps data. The field offices that provided data for Weist's study were the US Army Corps of Engineers, Missouri River Division, Omaha; and the Pittsburgh District (Ohio River Valley), Pennsylvania. At times, studies deserving of appropriate maps lack them: Jane Lamm Carroll, "Dams and Damages: The Ojibway, the United States, and the Mississippi Headwaters Reservoirs," *Minnesota History* 52, number 1 (1990): 3–15. This is a historic study—circa 1880s—and would have benefited from detailed reservoir maps; its author was then a historian with the US Corps of Engineers and, I would think, had access to suitable maps.

45. Imre Sutton, "Geographical Aspects of Construction Planning: Hoover Dam Revisited," *Journal of the West* 7, number 3 (1968): 301–344, ref. pp. 327–334. See also my map and discussion in *Indian Land Tenure,*166–171 and a modified edition of it in Waldman and Braun, *Atlas of the North American Indian,* 202. Cf. Daniel McCool, *Command of the Waters: Iron Triangles, Federal Water Development, and Indian Water* (Berkeley: University of California Press, 1987), esp. chapter 6, "Conflicts among Programs and Priorities."

46. See T. J. Ferguson, *Öngtupqa niqw Pisisvayu* [Salt Canyon and the Colorado River]: *The Hopi People and the Grand Canyon,* Final Ethnohistoric Report for the Hopi Glen Canyon Environmental Studies Project (Kykotsmovi, Arizona: Hopi Cultural Preservation Office, 1998); William R. Coffeen, "The Effects of the Central Arizona Project on the Fort McDowell Indian Community," *Ethnohistory* 19, number 4 (1972): 345–377. The project in question was Orme Dam, which was ultimately withdrawn since it would have flooded most of the reservation. See Patricia Mariella and Violet Mitchell-Enos, "Yavapi," in Davis, ed., *Native America,* 710–712. The Coffeen study includes several maps, including one of the damsite and reservoir area (fig. 5), exchange lands (fig. 6), and others.

47. Hunt, "Land Tenure and Economic Development"; Sutton, "Land Tenure and Occupance Change," 281–283 and fig. LXII.

48. See Ward Churchill and Winona LaDuke, "Native North America: The Political Economy of Radioactive Colonialism," in *The State of Native America: Genocide, Colonization, and Resistance,* ed. M. Annette Jaimes (Boston: South End Press, 1992), 241–266, maps on 250, 254. Churchill discusses the concept of national sacrifice areas. LaDuke, *All Our Relations,* maps on 74 and 96. The cartography is attributed to Zoltan Grossman—mtn@igc.apc.org—but otherwise sources are not fully detailed. Regrettably, Donald A. Grinde and Bruce E. Johansen, in *Ecocide of Native America: Environmental Destruction of Indian Lands and Peoples* (Santa Fe: Clear Light Publishers, 1995), and Donald L. Fixico, in *The Invasion of Indian Country in the Twentieth Century*

(Niwot: University Press of Colorado, 1998), do not provide any maps to accompany important geographic discussions.

49. "The Indian Claims Commission Act of 1946," 60 *Stat.* 1049.

50. Indian Claims Commission, *Final Report* (Washington, DC: Government Printing Office, 1979), "Indian Land Areas Judicially Established," map scale: 1:4,000,000, compiled, edited, and published by the US Geological Survey. "This map portrays the results of cases as before the U.S. Indian Claims Commission or U.S. Court of Claims." It is likely, but not confirmed, that the reference to the Court of Claims identifies cases forwarded from the ICC and not those earlier reported by E. B. Smith, comp., *Indian Tribal Claims: Decided in the Court of Claims of the United States, Briefed and Compiled to June 30, 1947* (Washington, DC: University Publications of America, 1976). One might want to compare the ICC map with another by Sam B. Hilliard, "Indian Land Cessions," which includes a map of "Land Claims by Tribe." While some claims areas compare well with adjudicated areas on the ICC map, keep in mind that claims and adjudication do not necessarily represent exactly the same subject matter. The former is the tribal perception of loss and the latter is the adjudicated rendering of that loss.

51. Sutton, *Irredeemable America,* especially "Configurations of Land Claims . . .," fig. 5.5, attempts to reconstruct the variable mappable elements in boundary exhibits on claims maps. Ward Churchill, "The Earth is Our Mother: Struggles for American Indian Land and Liberation in the Contemporary United States," in Jaimes, ed., *The State of Native America,* 139–1188, maps 1–6. See for usage of claims cartography: R. H. Ruby and J. A. Brown, *The Spokane Indians: Children of the Sun* (Norman: University of Oklahoma Press, 1970).

52. Some 200 volumes were published by Garland Publishing Company in New York. Many of these volumes include photocopies of map exhibits. While the Clearwater Publishing Company's microfiche series includes far more documents, it does not provide maps that can be easily scrutinized. To date, there is no known complete compilation of land claims maps. An example of a Garland publication is: Ralph L. Beals, *Indian Occupancy, Subsistence and Land Use Patterns in California,* in *California Indians* VI (New York: Garland Publishing Company, 1974). The two volumes by Norman A. Ross, *Index to the Expert Testimony before the Indian Claims Commission: The Written Reports* (New York: Clearwater Publishing Company, 1973) and *Index to the Decisions of the Indian Claims Commission* (New York: Clearwater, 1973) serve as catalogs to the microfiche collection. Bibliographies in this special field are rare, but see Richard H. Weil, *A Bibliography of American Indian Land Claims*, Public Administration Series P2145 (Monticello, IL: Vance Bibliographies, 1987). Unfortunately, this volume lacks a discussion or entry relating to maps.

53. One of Kroeber's students—Omer Stewart—told me that geographer Carl Sauer was influential in preparing him to work with maps in the Indian field. For Stewart's capacity with maps, see Stewart, "The Shoshone Claims Cases," in *Irredeemable America,* 187–206, ref. to figures 8.3 and 8. 4., 198–199.

54. Kroeber, *Natural and Cultural Areas.* For comments on Kroeber's cartographic objectives, see Imre Sutton, *Indian Land Tenure,* 31–32; poignant comments about Kroeber in Ralph L. Beals, "The Anthropologist as Expert Witness: Illustrations from the California Indian Land Claims Case," in *Irredeemable America,* 139–155; and Omer C. Stewart, "Kroeber and the Indian Claims Commission Cases," *Kroeber Anthropological*

Society Papers 25 (1961): 181–190. Kroeber also published on land tenure: "Nature of the Land-Holding Group," *Ethnohistory* 2, number 2 (1955): 303–315, and "The Nature of the Land-Holding Group in Aboriginal California," in *Aboriginal California: Three Studies in Culture History*, ed. Robert F. Heizer (Berkeley: University of California Press, 1963), 81–120.

55. Kroeber, *Natural and Cultural Areas,* 8.

56. Stewart, "The Shoshone Claims Cases," 198–199, figs. 8.3 and 8.4. As editor of *Irredeemable America*, I had the opportunity to utilize Stewart's large, multiply folded and highly detailed map of the Great Basin, which shows dozens of lines representing the accounts of various observers.

57. D'Azevedo, *Great Basin.*

58. Richard O. Clemmer and Omer C. Stewart, "Treaties, Reservations, and Claims," in D'Azevedo, *Great Basin,* 553.

59. Ibid.

60. Omer C. Stewart, "Tribal Distributions and Boundaries in the Great Basin," in W. L. d'Azevedo, Wilbur A. Davis, Don D. Fowler, and Wayne Suttles, eds., *The Current Status of Anthropological Research in the Great Basin, 1964*, Social Science and Humanities Publications 1 (Reno: Desert Research Institute, 1966), 167–237.

61. Stewart, "The Shoshone Claims Cases," 198–199.

62. Omer C. Stewart, "The Question of Bannock Territory," in E. H. Swanson Jr, ed., *Languages and Cultures of Western North America: Essays in Honor of Sven S. Liljeblad* (Pocatello: Idaho State University Press, 1970): 201–231.

63. Harold Driver et al., *Indian Tribes of North America.*

64. Erminie Wheeler-Voegelin, "History and Ethnohistory, and a Case in Point," in A. F. C. Wallace, ed., *Men and Cultures. Selected Papers, Fifth International Congress of Anthropological and Ethnographical Sciences* (Philadelphia: University of Pennsylvania Press, 1956): 364–367.

65. Verne F. Ray, review of *Indian Tribes of North America* by Driver et al., *American Anthropologist* 57 (1953): 145–146.

66. Heizer, *Languages, Territories,"* 26; see also my review of Heizer in *Professional Geographer* XX, number 1 (January 1968): 75–76.

67. Heizer, *Languages.*

68. Kroeber's expertise became the foundation for research background that abetted the plaintiff tribes in *Indians of California v. US* On the case, see Beals, "The Anthropologist as Expert Witness," 139–156. Inasmuch as *Indians of California* was consolidated by the ICC, the earlier detailed efforts to delimit territories of bands and tribelets in California did not figure importantly in the final determination of acreage. However, greater accuracy in the configuration of outer boundaries of the two California claims cases would have been achieved. But, no doubt, the replication of the methods utilized in California assisted in mapping elsewhere.

69. While the ICC relied on Royce numbers in litigation, the map of "Indian Land Areas Judicially Established" (1978) indicates area numbers based on the "Indian Land Area Map Index." See ICC, *Final Report,* 131–137.

70. For a general discussion of tribal boundaries and claims cartography, see Imre Sutton, "Configurations of Land Claims."

71. D. M. Brugge, "A Linguistic Approach to Demographic Problems: the Tonto-Yavapai Boundary," *Ethnohistory* 12, number 4 (1965): 355–372.

72. Nancy O. Lurie, "The Indian Claims Commission Act," *Annals, American Academy of Political and Social Science* 311 (May 1957): 56–70, ref. p. 66. See also Lurie, "Problems, Opportunities, and Recommendations," *Ethnohistory* 2 (Fall 1955): 357–375. Note that Ralph Beals, as chief defense expert witness in *California Indians v. US* relied on the 'nuclear theory' in arguing that California bands and tribes did not effectively utilize total territory (see Beals, "The Anthropologist as Expert Witness" and Beals and James A. Hester Jr., "A New Ecological Typology of the California Indians," *Selected Papers, Fifth International Congress of Anthropological and Ethnographical Sciences* (Philadelphia: University of Pennsylvania Press, 1956), 411–419. For a general summary of the earlier studies, see Imre Sutton, *Indian Land Tenure*, 95–106. For another account of ethnohistory, see Kerwin Lee Klein, *Frontiers of Historical Imagination: Narrating the European Conquest of Native America, 1890–1990* (Berkeley: University of California Press, 1997), 183–186 and *passim*.

73. J. A. Jones, "Problems, Opportunities, and Recommendations," *Ethnohistory* 2, number 4 (1955): 347–355, ref. pp. 347–348. On other interpretations of *tribe*, see Sutton, *Indian Land Tenure,* 186–193.

74. Jones, "Problems," 350–351. Note that Jones had worked for the US Justice Department and was quite familiar with many cases. Cf. Verne F. Ray, introduction to "Anthropology and Indian Claims Litigation: Papers Presented at a Symposium Held at Detroit in December, 1954," *Ethnohistory* 2, number 4 (1955): 287–291, ref. p. 288.

75. Lurie, "Problems, Opportunities," 364.

76. Ibid., 365.

77. Ibid. This is perhaps what happened in the case of the Havasupai claims (see John F. Martin, "From Judgment to Land Restoration: The Havasupai Land Claims Case," in Sutton, ed., *Irredeemable America,* 271–300, ref. to pp. 298–299).

78. Homer Aschmann, a geographer, hailed from the University of California, Berkeley, and did participate as an expert witness. See his "Environment and Ecology in the 'Northern Tonto' Claim Area," expert testimony prepared for Docket no. 22-J, (1963), in *Apache Indians 5, A Study of Western Apache Indians, 1846–1886* (New York: Garland Publishing Company, 1974), 167–232 (28 *Indian Claims Commission* 423 [1972]). I more thoroughly discuss this crossover of anthropology and geography in: "Indian Affairs and Geographers: The Research Vitality of Land Tenure," unpublished manuscript, forthcoming in a Festschrift volume honoring Henry J. Bruman (professor emeritus of geography, UCLA). Also see a recent review of geographic contributions to the study of the Indian: Robert Rundstrom, Douglas Deur, Kate Berry, and Dick Winchell, "Recent Geographical Research on Indians and Inuit in the United States and Canada," *American Indian Culture and Research Journal* 24, number 2 (2000): 85–110.

79. Yarborough, "Index to the Map," 127–130, ref. p. 127.

80. Ibid., 128.

81. Ibid. Emphasis added.

82. For commentaries on the published findings, decisions, and expert testimony, see my comments: "Appendix B: Bibliographical Note," in *Irredeemable America,* 399–401, and updated in "Appendix B: The Documentary Record," in Imre Sutton, ed., "The Continuing Saga of Indian Land Claims," *American Indian Culture and Research Journal* 24, number 1 (2000): 196–197.

83. *Indians of California vs. US.* See also Stewart, "Kroeber and the Indian Claims

Commission Cases"; Florence C. Shipek, "Mission Indians and Indians of California Land Claims," *American Indian Quarterly* 13, number 4 (1989): 407–420; and Lurie, "Problems, Opportunities," 368–369.

84. Alfred L. Kroeber, *Handbook of the Indians of California* (Washington, DC: Government Printing Office, 1925). Note that publication of this volume was postponed and the actual completion date was circa 1918.

85. US Congress, House, *Report with Respect to the House Resolution,* Appendix IV, Maps 1–75; quote on p. 156. Emphasis added. I adapted three tribal areas from this document as based on Kroeber, in *Indian Land Tenure*, fig. 2, "Tribal Territory and Reservations."

86. See Sutton, "Not All Aboriginal Territory," 140–141 and fig. 1.

87. David J. Wishart, "Belated Justice? The Indian Claims Commission and the Waitangi Tribunal," *American Indian Culture and Research Journal* 25, number 1 (2001): fig. 6 ("Payments [Consideration] Established by the Indian Claims Commission") and fig. 7 ("Fair Market Value Established by the Indian Claims Commission"). Both maps superimpose monetary values upon the configurations of judicially established claims areas as based on the 1978 ICC map. Wishart published another pair of maps, "Payments to Indians" and "Fair Market Value," but only for the Great Plains, in Wishart, "Compensation for Dispossession: Payments to the Indians for Their Lands on the Central and Northern Great Plains in the 19th Century," *National Geographic Research* 6, number 1 (1990): 94–109, fig. 2. These maps appear in multiple colors.

88. David H. Getches, Charles F. Wilkinson, and Robert A. Williams Jr., *Cases and Materials on Federal Indian Law,* Fourth Edition (St. Paul: West Publishing Company, 1998), chap. 12, 860–901, esp. 871–901, which deal with off-reservation rights; Francis P. Prucha, *American Indian Treaties, passim.*

89. On water rights, see: *Winters v. United States*, 207 US 564 (1908); Getches et al., *Cases and Materials on Federal Indian Law*, 791–859.

90. See: Imre Sutton, "Indian Cultural, Historical, and Sacred Resources: How Tribes, Trustees, and the Citizenry Have Invoked Conservation," in Clow and Sutton, eds., *Trusteeship in Change,* chap. 7, 165–193; Thomas F. King, *Cultural Resources, Laws and Practice: An Introductory Guide* (Walnut Creek, California: AltaMira Press, 1998).

91. Several studies focus on fishing rights in litigation: see Fay G. Cohen, *Treaties on Trial: The Continuing Controversy over Northwest Indian Fishing Rights* (Seattle: University of Washington Press, 1986), figs. 8.2 ("Map of the Columbia River below McNary Dam showing areas open to commercial fishing") and 8.3 ("Ocean Jurisdiction Map"). These maps owe their origin to the Columbia River Inter-Tribal Fish Commission. Cf. Melissa Powers, "The Spirit of the Salmon: How the Tribal Restoration Plan Could Restore Columbia Basin Salmon," *Environmental Law* 30, number 4 (2000): 867–910. No doubt more detailed maps have been prepared by the commission.

92. Map coverage of water rights litigation is mostly derivative, but discussions bring forward the state of agreement and litigation. See Daniel McCool and Laura Kirwan, "Negotiated Water Settlements: Environmentalists and American Indians," in Clow and Sutton, eds., *Trusteeship in Change*, chap. 10. For a very different water map that utilizes an early map of mine (*Indian Land Tenure*, fig. 8), see Frantz, *Indian Reservations,* fig. 8.1, which relates Indian reservations and dam projects to moisture zones (humid, subhumid, etc.). Other water project maps involving Indian lands

include Thomas R. McGuire, "Indian Water Rights Settlements: A Case Study in the Rhetoric of Implementation," *American Indian Culture and Research Journal* 15, number 2 (1991): 139–169, figs. 2 ("The Tucson Basin") and 3 ("Avra Valley and Vicinity"). The study focuses on the Central Arizona Project and the Tohono O'Odham San Xavier District.

93. The Endangered Species Act may be found at 16 USC §§1531–1544. See Sandi B. Zellmer, "Conserving Ecosystems Through the Secretarial Order on Tribal Rights," *Natural Resources and Environment* 14, number 3 (Winter 2000): 162–165, 211–214; Imre Sutton, "Tribes and States: The Political Geography of Indian Environmental Jurisdiction," in Clow and Sutton, eds., *Trusteeship in Change,* chap. 9, 239–263.

94. "The Native American Graves Protection and Repatriation Act [NAGPRA]," *Arizona Law Journal* 24, number 1 (1992); and Devon A. Mihesuah, ed., "Repatriation: An Interdisciplinary Dialogue," *American Indian Quarterly* 20, number 2 (1996): 153–307; Jhon Goes In Center and Bryan Marozas, cochairs, "The Relevance of Tribal Aboriginal Territories in the Interpretation, Protection, and Restoration of Cultural Resources," for the meetings of the 1999 American Assn. for State and Local History, Baltimore, Maryland, October 1999. Copy of prepared talk sent to author by B. A. Marozas, July 1999. Goes in Center is president of Innovative GIS Solutions, Inc. (Fort Collins, Colorado) and Marozas was then GIS coordinator, BIA (Albuquerque, New Mexico); see also id., "The Role of Spatial Information in the Assessment of Cultural Affiliation," in "Native American Graves Protection and Repatriation Act," *Hearings . . . on PL 101-601,* Commissioner on Indian Affairs, US Senate, 106th Cong., 1st Sess. (Washington, DC: Government Printing Office, 1999); this paper was also presented at the Thirteenth Annual Conference on Geographic Information Systems, Vancouver, British Columbia, 1999, [Abstracts], 422–427.

95. No one map reports the totality of land restorations for various reasons; but a few maps have been prepared. See Sutton, "Incident or Event?" in Sutton, ed., *Irredeemable America*; for the Havasupai, see Martin, "From Judgment to Land Restoration, in Sutton, ed., *Irredeemable America,* 271–300, ref. to n. 1, pp. 298–299. The discussion indicates that several different interpretations of original and later boundaries for this tribe can be rendered. Cf. Kendra S. McNally, "The Grand Canyon National Park Enlargement Act: Perspectives on Protection of a National Resource," *Arizona Law Review* 18, number 1 (1976): 232–275; McNally provides a map based upon one in hearings before congressional committees. For the Timbisha, see Steven Haberfeld, "Government-to-Government Negotiations: How the Timbisha Shoshone Got Its Land Back," *American Indian Culture and Research Journal* 24, number 4 (2000): 127–165. Note that the maps—figs. 2 and 3—which reveal Tribal Cooperative Activity Areas within Death Valley National Park, were produced by the Bureau of Land Management. The Taos and Zuni restorations are discussed in Sutton, "Incident or Event?" See also E. Richard Hart, "Zuni Claims: An Expert Witness' Reflections," in "The Continuing Saga of Indian Land Claims," 163–171, and fig. 2. The Yakama map of the Mt. Adams boundary changes appears in *Yakima Indian Nation* (Toppenish, WA: Yakima Indian Agency, BIA, 1971) and is published in a slightly revised form in Sutton, *Irredeemable America,* fig. 9.1, 216.

96. See Lawrence M. Lesko and Renée C. Thakali, "Traditional Knowledge and Tribal Partnership on the Kaibab National Forest with an Emphasis on the Hopi Interagency Management," in Clow and Sutton, eds., *Trusteeship in Change,* chap. 11,

281–301. Cf. Ferguson, *Öngtupqa niqw Pisisvayu,* fig. 10, "Hopi *Tutskwa*," 66. This includes several maps that portray original Hopi territory relative to a partnership with the Forest Service.

97. See Marozas and Goes in Center, "The Role of Spatial Information."

98. Cf. Christie, "The Catawba Indian Land Claim."

99. Correspondence from the Phoenix Area Office, Branch of Real Estate Services, by John Philbin, January 17, 2002. The agency reports that the Branch of Roads at the Western Regional Office assumes major responsibility for mapping. The branch produces, revises, and updates reservation maps. The Branch of Realty produces other maps, as related to appraisals, and the Branch of Land and Water Resources produces maps of dams, safety zones, and floodways. The Branch of Land Operations produces soil and land class maps as well as maps of rangelands. The Branch of Housing produces subdivision maps and the Branch of Environmental Quality Services produces and reviews maps of tribal cultural property and archaeological sites pursuant to NEPA and NHPA.

100. This section has made heavy use of manuscripts sent to me by Bryan Marozas, currently a staff member of the Office of Indian Trust Transition and formerly GIS coordinator of the BIA, Albuquerque. "Tribal Use of GIS and Remote Sensing," a presentation at the South West Gathering RS/GIS Workshop Planning Meeting, March 19, 1998, at Albuquerque, New Mexico. Base data layer themes, as for roads, lakes, timber types, were developed on USGS quad sheets at a scale of 1:24,000 for most reservations. Then databases were developed and inserted into a digital library, which were made available online with free use of Arc/Info GIS software. Marozas notes that some fifty tribes were already utilizing GIS technology in 1992. He also stresses that "BIA projects are mostly conducted through the Forestry departments," including wildlife mapping projects, which are an important source of land cover types.

101. Marozas, "Tribal Use of GIS," lists for the Southwest tribes that have their own GIS departments and are busy supporting their IRMP (Integrated Resource Management Plan): Jicarilla Apache, Jemez, Santa Clara, Cochiti, Nambe, Zuni, Santa Ana, Sandia, and others that are known to have GIS capabilities, including San Carlos Apache, Southern Ute, Navajo, and Hopi. In an updated study, "A Brief History of Tribal GIS Implementation (1985–2000) and the Progression to Stand Alone Systems (2000)," Marozas identifies specific land use concerns of Southwest tribes; e.g., the Jemez are concerned with cultural resources and forest management; Santa Clara is using GIS to support land claims; Zuni are developing agricultural databases and using GIS to manage arroyos.

One may visit a website entitled "Maps: GIS Windows on Native Lands, Current Places, and History [http://www.kstrom.net/isk/maps/US.html]. It includes generalized maps of reservations, and states in which judicially established Indian lands may be found (but the site does not actually reveal the existing ICC map of 1978). Other data relate to reservations in Minnesota, Alaska, and tribes and bands in California. The site is not really useful for serious research on land tenure or territoriality. The last update was in 1997.

102. With reference to off-reservation sites, as related to cultural resource management, see Imre Sutton, "Indian Cultural, Historical and Sacred Resources: How Tribes, Trustees, and the Citizenry Have Invoked Conservation," chap. 7, and Lawrence M. Lesko and Reneé G. Thakali, "Traditional Knowledge and Tribal Partnership on the

Kaibab National Forest with an Emphasis on the Hopi Interagency Management," chap. 11 in Richmond L. Clow and Imre Sutton, eds., *Trusteeship in Change: Toward Tribal Autonomy in Resource Management* (Boulder: University Press of Colorado, 2001), 165–193 and 281–301.

103. For example, the state directors of the Bureau of Land Management provide land status information on their *Master Title Plates, Historical Indexes, Cadastral Survey Records,* and other materials. Cartographic records of the BIA are identified with Record Group 75, housed at the several Federal Record Centers and by the National Archives and Records Administration. And, of course, the Library of Congress maintains earlier cartographic records. Correspondence with Phoenix Area Office, January 17, 2002.

104. The Phoenix Area Office, of all regional offices of the BIA, provided the most comprehensive response to my research questions. While it is logical that various federal land agencies would generally maintain cartographic records of trust lands, not too many universities across the country would be repositories of similar maps.

105. Indian Self-Determination and Education Assistance Act, 88 Stat. 2203 (1975). I made an attempt to generalize the larger Indian Country that includes adjacent political area. See Imre Sutton, "Preface to Indian Country: Geography and Law," *American Indian Culture and Research Journal* 15, number 2 (1991): 3–35, ref. fig. 4, p. 20.

106. Daniel Cole, "One Cartographic View of American Indian Land Areas," *Cartographica* 30, number 1 (1993), monograph 44: 47–54, ref. to p. 53.

107. "Indian Lands in the United States," map prepared by the BIA, Geographical Map Service Center, 1998, and published by the US Geological Survey, Box 25286, Denver 80225-0046 (2000), ISBN 0-607-90852-1.

108. Correspondence from the Rocky Mountain Regional Office, BIA, Billings, Montana, November 28, 2001, and from the Portland Area Office, BIA, Portland, OR, November 27, 2001.

109. A compendious source that includes details of land use is: Tiller, ed., *Tiller's Guide to Indian Country*. However, maps in this volume are only locational.

110. Frantz, *Indian Reservations,* figs. 3.11 and 3.12. Goodman, *Navajo Atlas,* also includes maps dealing with livestock and grazing capacity (figs. 31 and 33) as based on data by the Office of Land Operations, Navajo Tribe, Window Rock. Hart's *Zuni Atlas* includes a map of grazing units (fig. 37), which is based on BIA, grazing unit map, at the Zuni Agency, Albuquerque Area Office. He also provides a reconstruction of traditional Zuni grazing areas (fig. 14).

111. Diane L. Krahe, "The Mission Mountains Tribal Wilderness," in Clow and Sutton, eds., *Trusteeship in Change,* ch. 8, figs. 8.3a, b, and c. For other examples, see Ballas, "A Cultural Geography"; and Sutton, "Land Tenure and Occupance Change." Cf. Winona LaDuke, *All Our Relations,* 26, a map of the Seminole area, South Florida, showing various land uses. One example of the frustration in gaining specific map data has to do with my own efforts: I sought cartographic data about Blue Lake, which was restored to the Taos Pueblo in New Mexico. After several unanswered letters to the Taos Pueblo, I ultimately secured sufficient cartographic data only from the Kit Carson National Forest, not the Pueblo. See Imre Sutton, "Incident or Event?" 215–217 and fig. 9. 1.

112. See Ward Churchill and Winona LaDuke, "Native North America: The

Political Economy of Radioactive Colonialism," in Jaimes, ed., *The State of Native America,* 241–266, esp. map 1 (p. 250) and map 2 (p. 254). *Cf.* Winona LaDuke, *All Our Relations,* 74, a map of coal deposits on various reservations including the Northern Cheyenne; 96, a map of nuclear waste including current and former tribes that have pursued Monitored Retrievable Storage. For broader environmental concerns, see Americans for Indian Opportunity, *Survey of American Indian Environmental Protection Needs on Reservation Lands: 1986,* submitted to the Environmental Protection Agency, September 1986.

113. See Bryan Marozas, "The Role of Geographic Information Systems in American Indian Land and Water Rights Litigation," *American Indian Culture and Research Journal* 15, number 3 (1991): 77–93. Many tribes have expanded upon new technology as well as indigenous planning. For example, the Menominee Nation, Sustainable Development Institute at Keshena (in Wisconsin) is developing applications of a "Multipurpose Land Information System—A Collaborative Effort," *Sustainable Nations* 1, number 1 (September–December 1999).

114. Such programs and trained staff in the Southwest include: Chemehuevi, Colorado River, Fort Mojave, Fort Apache, Quechan (Yuma Indian Reservation), Hopi, O'Odham Nation (formerly Papago Indian Reservation), Ak Chin, Gila River, Fort McDowell, Pascua Yaqui, Salt River, San Carlos, Yavapai-Prescott, Elko Te-Moak, Pyramid Lake Pauite, Washoe, Las Vegas Paiute, Moapa Paiute, and Ute. This listing suggests that GIS has become fundamental to tribal land use planning. Correspondence with Phoenix Area Office, January 17, 2002. This office advises that if any of the tribes are pursuing land consolidation plans, as adopted under §204 of the ILCA, such may be treated as "proprietary information."

115. Frantz, *Indian Reservations,* 53–54 and fig. 3.7.

116. ILCA, 25 USCA, §2201; PL 106-462 (2000) contains amendments. See Bureau of Indian Affairs, "Notice to Indian Land Owners," (pamphlet) 2000 (?). In the Southwest, only the Gila River and Fallon tribes have expressed an interest (correspondence with Phoenix Area Office). For the Northwest, several intertribal meetings were held in April 2001 to present an Indian Land Tenure Partnership Plan hosted by the Intertribal GIS Council (correspondence from Danielle P. Dutt, Portland Area Office, BIA, November 27, 2001). §2203 (formerly §204) discusses the options for tribes that seek land consolidation efforts toward "eliminating undivided fractional interests."

117. 25 USCA, §§ 2201–2211; 481 US 704 (1987).

118. *Babbitt v. Youpee* 117 S. Ct. 727 (1997).

119. See Getches et al., *Federal Indian Law,* 174–175.

120. "Status Report to the Court, Number Eight [August 1 to December 31, 2001]," (Washington, DC: US Department of the Interior, January 16, 2002), 59. See also BIA, "Notice to Indian Land Owners."

121. Correspondence with Scott Brueninger, Chippewa of Lac Courte Oreilles Band, from Great Lakes Agency, Ashland, Wisconsin, October 2001, which he shared with me.

122. Tiller, *Tiller's Guide to Indian Country,* 237.

123. On Foxwoods, see Anne-Marie d'Hauteserre, "Foxwoods Casino Resort: An Unusual Experiment in Economic Development," *Economic Geography* extra issue (1998): 112–121. A pair of maps of the Foxwoods development appears in Jeff Benedict, *Without Reservation: The Making of America's Most Powerful Indian Tribe and Foxwoods, the World's Largest Casino* (NY: HarperCollins, 2000), 355–356. The

first reveals acreage approved for the reservation; additional acreage to be added; and another purchase area, formerly a scout camp. The other map shows the existing reservation, new settlement lands, and lands to be transferred by the State of Connecticut , which includes a Pequot burial ground. Map credits appear on p. 370.

124. Frantz, *Indian Reservations*, 53. The data was supplied by the BIA Area realty office in Aberdeen, South Dakota). Frantz prepared a map (fig. 3.7) which includes allotments purchased by the Salt River tribes.

125. *Washington Department of Ecology v. EPA*, 752 *F 2d* 1465 (Ninth Circuit 1985); Imre Sutton, "Preface to Indian Country: Geography and Law," 3–36; David J. Wishart and Oliver Froehling, "Land Ownership, Population, and Jurisdiction: The Case of the *Devils Lake Sioux Tribe v. North Dakota Public Service Commission*," *American Indian Culture and Research Journal* 20, number 2: 33–58 (1996). Cf. *Brendale v. Confederated Tribes of the Yakima Nation*, 109 S. Ct. 2994 (1989); and *South Dakota v. Yankton Sioux Tribe et al.*, 523 US 1044 (1998); and Cf. Imre Sutton, "Indian Country and the Law: Land Tenure, Tribal Sovereignty, and the States," in *Law in the Western United States*, ed. Gordon M. Bakken (Norman: University of Oklahoma Press, 2000): 251–266; ref. pp. 263–264.

126. Indian Country is defined in 63 Stat. 94, and further discussed in Vine Deloria Jr. and Clifford M. Lytle, *American Indians, American Justice* (Austin: University of Texas Press, 1983): 58–79.

127. For an alternative spatial analysis of Indian Country, see Sutton, "Preface to Indian Country." This study includes three maps—figures 2, 3, and 4—that schematically attempt to demonstrate that Indian Country extends beyond the areas of legal definition. As I observed of Indian Country, "[A]lthough many observers would readily identify it with tribes in the hinterland, few would recognize the unique polity of this place" (p. 3). To my knowledge, the only map regularly entitled "Indian Country" has been published by the Automobile Club of Southern California (#2345; scale: 12 miles=1 inch; various dates). While it shows a good part of the Southwest, its intent is to show the general region that includes various reservations, including the Hopi, Navajo, Zuni, and others. It is not intended as a political term.

128. See Carol Goldberg-Ambrose, *Planting Tail Feathers: Tribal Survival and Public Law 280* (Los Angeles: American Indian Studies Center, 1998). For an attempt to map PL 280, see Imre Sutton, *Indian Land Tenure,* 153 (fig. 7, "Legal Jurisdiction over Indians"); Sutton, "Sovereign States," fig. 3, "Jurisdiction of Indian Reservations by State." With reference to South Dakota's state map, see Sutton, "Sovereign States," figure 1B and discussion in Sutton, "Preface to Indian Country," 18–19.

129. *Montana v. US*, 450 US 544 (1981).

130. *Washington Dept. of Ecology v. EPA*, 752 F. 2nd 1465 (1985).

131. See Wishart and Froehling, *Devils Lake Sioux Tribe* and *Brendale v. Confederated Tribes of the Yakima Nation*.

132. Indian Gaming Regulatory Act of 1988, 25 USCA §§ 2701–2721 (Supp. 1996); see discussion in Getches et al., *Federal Indian Law,* 739–753. To date, several books deal with Indian casinos: W. Dale Mason, *Indian Gaming: Tribal Sovereignty and American Politics* (Norman: University of Oklahoma Press, 2000). The book focuses on New Mexico but includes some data on Oklahoma, for which it includes a map of "Oklahoma Indian Bingo Facilities" (1998), as provided by the National Indian Gaming Commission (pp. 178–179). Angela Mullis and David Kamper, eds., *Indian*

Gaming: Who Wins? (Los Angeles: UCLA American Indian Studies Center, 2000), which is based on a 1997 UCLA conference and includes views of scholars, Indians, and others. Two volumes contain a wealth of geographic interpretations including a few maps: Alan A. Lew and George A. Van Otten, eds., *Tourism and Gaming on American Indian Lands* (New York: Cognizant Communication Corporation, 1998), which includes useful maps of Foxwoods (pp. 131 and 134), revealing newly purchased lands for casino/resort expansion. There are also maps of casinos in New Mexico (p. 190). In the other volume (Klaus J. Meyer-Arendt and Rudi Hartmann, eds., *Casino Gambling in America: Origins, Trends and Impacts* [New York: Cognizant Communication Corporation, 1998]) there is a map of casinos in North and South Dakota (p. 79), Oklahoma (p. 97), and the South (pp. 102, 105).

133. See also Imre Sutton, "Recognition and Casinos are Separate Issues," *Los Angeles Times*, Aug. 17, 1997, op-ed page, B7. There are numerous newspaper articles referring to California casinos: Daryl Kelley, "Oxnard Says No Dice to Casino Bid," *Los Angeles Times*, May 10, 2001: B1, 10.

134. On Oklahoma tribes, see Mason, *Indian Gaming,* 217.

135. See d'Hauteserre, "Foxwoods Casino Resort"; unfortunately, the article lacks maps. A pair of maps of the Foxwoods development appears in Benedict, *Without Reservation*, 355–356. See, more generally, William N. Thompson, "History, Development and Legislation of Native American Casino Gaming," and Carl A. Boger Jr., Daniel Spears, Karen Wolfe, and Li-chun Lin, "Economic Impacts of Native American Casino Gaming," in *Legalized Casino Gambling in the United States: The Economic and Social Impact,* Cathy H. C. Hsu, ed. (New York: The Haworth Press, 1999), 41–61 and 135–154, respectively. Unfortunately neither study includes maps. On annexation, see Barbara A. Carmichael and Donald M. Peppard Jr., "The Impacts of Foxwoods Resort Casino on Its Dual Host Community: Southeastern Connecticut and the Mashantucket Pequot Tribe," in Lew and Otten, eds., *Tourism and Gaming,* 133–136.

136. Just prior to the close of the Clinton Administration, then Secretary of the Interior Bruce Babbitt proposed tightening the policy of allowing tribes to secure trust status for the purpose of establishing a casino on lands purchased outside existing reservations. Whether policy changes over new trust lands will occur and thus impact Indian gaming remains open-ended at present. See "US Department of the Interior Press Release," April 8, 1999, and 25 CFR, § 151.

137. While tribes often contract with various research, environmental, and consultant firms, as well as public agencies, it is advisable that researchers consult with tribes themselves, many of whom have their own planning and environmental staff and facilities that fully utilize GIS technology.

138. See President William J. Clinton, "Executive Order 13007—Indian Sacred Places," May 25, 1996, *Weekly Compilation of Presidential Documents* 32 (May 27, 1996): 942–943; and Imre Sutton, "Indian Cultural, Historical and Sacred Resources," in Clow and Sutton, eds., *Trusteeship in Change,* 174–175.

139. Websites may prove useful in researching Indian maps. For example, visit falsepromises.com, which tells the story of the Wenatchi fishery reserve claim still pending as of June 2002. The site also exhibits a Wenatchi "Multiple Surveys" map of the fishery reserve. It is a fairly accurate map with seven overlapping configurations. A much larger website was proposed a dozen-or-so years ago. It was to be an online

map archive, developed and housed at the University of Wisconsin, Milwaukee. Its coverage would include all aspects of the cartographic record of Indians, and its developers had hoped to secure mappable data from official agencies, scholars, archives, and the like. As of summer 2002, this project was still in its developmental stage.