History Submerged - A Legacy of Modernity

An investigation of archaeological and social impacts of large scale dam construction in the Western United States

Thesis submitted by
Bradley L. Garrett
February 2006

Thesis submitted in partial fulfilment of the requirements for the Degree of Master of Maritime Archaeology in the School of Anthropology, Archaeology and Sociology at James Cook University

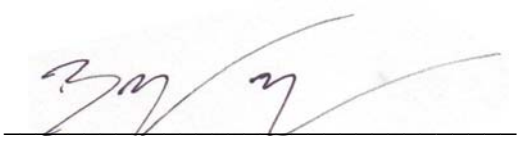
(Revised for submission to JCU library January 2007)

Statement of Access

I, the undersigned, the author of this thesis, understand that James Cook University of North Queensland will make it available for use within the university library and, by microfilm, digital file, or other means, allow access to users in other approved libraries. All users consulting this thesis will have to sign the following statement:

> In consulting this thesis I agree not to copy or closely paraphrase it in whole or in part without the written consent of the author; and to make proper public written acknowledgement for any assistance which I have obtained from it.
>
> Further, I will not reveal any locational information regarding archaeological sites contained within this thesis, without prior consultation with the author.

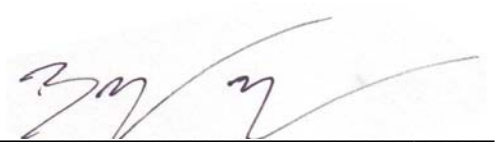
Beyond this, I do not wish to place any restrictions on access to this thesis.



11 - 02 - 2006

Statement on Sources Declaration

I declare that this thesis is my own work and has not been submitted in any form for another degree or diploma at any university or other institution of tertiary education. Information derived from the published or unpublished work of others has been acknowledged in the text and a list of references is given.



11 - 02 - 2006

Abstract

This thesis explores the role of intentionally induced inundation in historical contexts and the creation of 'underwater archaeologies'. The topic is discussed by analysing varied archaeological signatures before and after inundation events and subsequent reflexive human reactions in relation to these places.

The study will be limited to the context of human induced inundation due to modern 'development.' In particular, this study examines the effects of dam construction on the archaeological record in the Western United States. The thesis aims to articulate the concept that many of these places hold deep value to living people and mean more than simply lost 'data' from the perspective of an archaeologist or cultural resource manager. Underwater archaeological and cultural landscapes should not be ignored simply because they are submerged.

The approach included a rigorous background literature review, as well as analysis of discussions with archaeologists and people who lost access to cultural areas due to submergence. This provided insight into what sort of behaviours and responses inundation events in the past may have provoked, and how these reactions may have affected the material record. The topic of dam de-construction and site re-emersion will also be discussed. These are issues integral to the establishment of appropriate management regimes, which in many cases have never been proposed.

Acknowledgements

Not all our books will perish, our mutilated statues will again be sculpted and other domes and pediments will be born from our pediments and from our domes; some men will think, will work and will feel like us; I dare count on those who will carry on with our work and who are born at regular intervals throughout the centuries, with that intermittent immortality.

- Marguerite Yourcenar, *Hadrian's Memoirs, (1957)*

Three years ago, I was in Yucatan, Mexico, sitting at the edge of a cenote. The deep limestone sinkholes were (and are) viewed by the ancient Maya people as a gateway to the Xibalba, the underworld. I was on my first field expedition with the University of California Riverside under Dr. Scott Fedick, reading a copy of Daniel Lenihan's book Submerged: Adventures of Americas Most Elite Underwater Archaeology Team. The book, and my time spent with Scott, had a profound impact on my future as I gazed into the sacred cenote water and imagined diving into that dark realm to explore its ancient mysteries. One chapter Lenihan's adventures, called Damming the Past, was to become my passion for the next few years.

As I searched for a masters program in underwater archaeology that would allow me to explore the topic, I ran into Dr. Martin Gibbs at James Cook University. Dr. Gibbs encouraged me to take on the issue as he moved on from JCU. My next year was spent at James Cook University studying under one of the most renowned and prolific maritime archaeologists on the planet, William Jeffery.

Bill is one of the most patient, intelligent people I have ever met, and with his guidance, I developed the practical skills necessary to truly understand niches of the discipline. He also looked beyond borders, schooling me in international legislation, background knowledge that will always serve me well. At the same time, critical, exhausting, and absolutely enlightening theoretical discussions with Dr. David Roe, the head of the archaeology department helped me to understand what it truly meant to be a "maritime" archaeologist.

Dr. Shelley Greer, my thesis advisor, provided me with critical thesis advice and practical experience in cultural heritage management, which became a key component of the research. She also walked me through my first professional publication, with great patience, as I stirred up controversy with my naive ambition. Diane Westerhuis talked me through the frustrations of the M.A., and life in a backward town, and contributed to my understanding of quantitative methods in social sciences. Diane is the reason I will never trust a table again! Despite administrative disasters in the department, the faculty did their best to provide the best education possible. A heart-felt thanks goes out to the entire JCU faculty for their efforts.

Vivian Moran at the Maritime Museum of Townsville spent a number of hours walking us through curatorial research processes in the middle of museum openings and a constant battery of phone calls and visitors. She is truly a magician. Maritime archaeologist Peter Illidge spent hours with us in the field, crafting us not just into good maritime archaeologists, but also into worthy seafolk. Brad Duncan offered us support in many

different ways, and his brilliant PhD work on cultural landscapes and seascapes has been an invaluable source.

When we began this journey, there were seven of us in the masters of maritime archaeology program: Will Beynon, Sarah Amell, Ashley Porter, Jason Holden, Nicholas Bigourdan, Erika Stein, and myself. Somewhere along the way, we lost four of these people for different reasons, but each of them taught me a valuable lesson. The team that held together in the end, Erika, Nic and myself were eccentric, motivated, passionate, and as strong as steel. We will always be lifelong friends.

Erika was my love and guiding light through the whole year and a half of this M.A. It would not have happened without her encouragement and insight. The courage and passion she radiated on our Australian adventure brought me to tears on a number of occasions, and forced me to come to grips with my goals in life realistically. Erika is the most beautiful, courageous, wonderful feminine goddess I have ever known.

Both of my parents, Marcia Kulpa and Erpel Garrett offered me an amazing amount of support both financially and emotionally. They came to my aid again and again, getting me through the most arduous year of my life, always encouraging me to keep working through all of the difficulties, always knowing that I could transcend these trials.

The majority of this thesis was written in a dirty hotel room in Northern California built in 1901 that sat over highway 395 and shook like the end of the world every time a truck drove by (about every 2 ½ minutes). I worked for Cheryl Foster-Curley at the United States Bureau of Land Management Alturas field Office in the daylight hours, writing all night long with sage burning to keep the energy alive. I worked long days surveying and monitoring some of the most beautiful archaeology in the country, while Cheryl tirelessly explained the inner workings of government archaeology. Her contributions to this thesis are evident and appreciated. Likewise, my ecological colleague in Alturas, Lisabella Anderson, listened to me rant endlessly about underwater archaeology over many bottles of wine and during mandatory weekend road trips out of our backwater residence. Thanks for listening Lisa – wherever you are.

Thank you to Steven Brandt, Fekri Hassan, Anthony Oliver-Smith, Nancy Marie-White, George E. Smith, E. James Dixon, David G. Anderson, Bennie C. Keel, John H. Jameson, James E. Cobb, and J. W. Joseph for sending me their sections from Damming the Past. This thesis would not be what it is without their invaluable research added to the pool.

A special thanks to Fran Day at the Submerged Resource Center of the United States National Park Service. Fran provided almost dozens of sources for this thesis, and went through a great deal of excavation to get me all of the old reports I requested. NPS is lucky to have you Fran!

When researching this topic, I ran across the Winnemem Wintu's website, which discussed the loss of their homeland due to dam construction on the McCloud River. Their plight struck a deep cord, and I spent many hours talking with Charlotte Berta about the issue. She was extremely kind to me, and gave me the opportunity to speak with Caleen Sisk-Franco, the tribe's spiritual leader. I know that their time is the most valuable thing these people could have given me, and I am forever in debt to them for that.

My final acknowledgement goes to Adam R. Fish, the most brilliant anthropologist, archaeologist, filmmaker, writer, philosopher, and outrageous yogi I have ever met. Adam has been at my side since day one, and I know he always will be. Thank you for everything you do Adam.

Table of Contents

List of Figures

> *In societies where modern conditions of production prevail, all of life presents itself as an immense accumulation of spectacles. Everything that was directly lived has moved away into a representation*
>
> - (Debord 1995)

Chapter 1: Agendas

Goal of Thesis

The goal of this thesis is to explore the effects of intentionally induced inundation on archaeological sites in historical contexts and the creation of 'underwater archaeologies' in the Western United States. This research will take the form of an exhaustive, critical literature review supported by a number of well analysed case studies. Parts one through four will discuss archaeological, management and heritage issues associated with the topic. In part five, specific focus will be given to the construction of the Shasta Dam in Northern California and loss of access to cultural landscapes along the McCloud River by those who live in that area, including the Winnemem Wintu Native American Tribe. Using these examples, an argument will be made for consideration of heritage issues as a component of the Environmental Impact Assessment (EIA) process in the Western United States prior to dam construction. In cases where construction has already taken place, periodic monitoring of submerged sites in consultation with associated communities will be suggested as an appropriate management option. Options for the management of emerging area due to damn de-construction, a likely possibility in the postmodern period, will also be discussed. The thesis

will also suggest the need for long term monitoring projects in experimental submersion to confirm hypotheses on physical effects.

Specific Aims of the thesis are to:

- Examine the ways in which submerged sites were, and are, managed and mismanaged utilizing textual, oral and visual documentation.
- Discuss the possible and actual impacts of site inundation on historically cultural areas, both in physical and social terms.
- To discuss responses on a number of different levels to the event of inundation including Indigenous community responses, archaeological responses and state-level responses.
- Explore the role of new digital media and underwater technologies in mitigating the casualties of modernity by allowing people to re-experience lost landscapes.
- To examine, ethnographically, the way in which people today conceptualize these drowned landscapes.

All of this will be tied together by taking a closer look at the controversy surrounding the inundation of native Wintu land on the McCloud River, an ongoing action by the federal government which has provoked drastic community response.

Background to Topic

> *Now what we need is a great big dam,*
> *to throw a lot o' water across that land,*
> *People could work and stuff would grow,*
> *And you could wave goodbye to the old skid row.*
>
> - Woodie Guthrie (1997), *Talking fishing Blues*

Major impacts of dam construction in the Western United States occurred during the Great Depression (Figure 1) which peaked in the 1930s,

leading to the beginning of the big dam era which thrived in the modern period (1910-1980) (Anderson, et al. 2006). In the United States between 1929 and 1933, unemployment soared from approximately 3% to over 25%. As a response, in 1933, President Franklin D. Roosevelt stepped into office and implemented the 'New Deal', a radical change in government administration and policy which fuelled the creation of millions of jobs across the country (Parrish 1992: 347-351). Under the New Public Works Administration:

> There was no means test. Any guy could just walk into a county office – they were set up all over the country – and get a job... Within a period of sixty days, four million people were put to work [Terkel 1985: 256].

As a result, massive projects were undertaken by large crews of unskilled workers which excavated and/or destroyed a great deal of archaeology. The Roosevelt administration's philosophy was that 'people should be put to work immediately, even though it might be done inefficiently' (Terkel 1986: 256).

The big dam era had begun. Both big and small farmers, today consumed by multinational agribusinesses, became accustomed to the new wealth of resources reaped during the depression era into World War II, radical waterway manipulation became an integral part of North American 'necessity', displacing thousands along the bank of rivers and flooding countless archaeological sites.

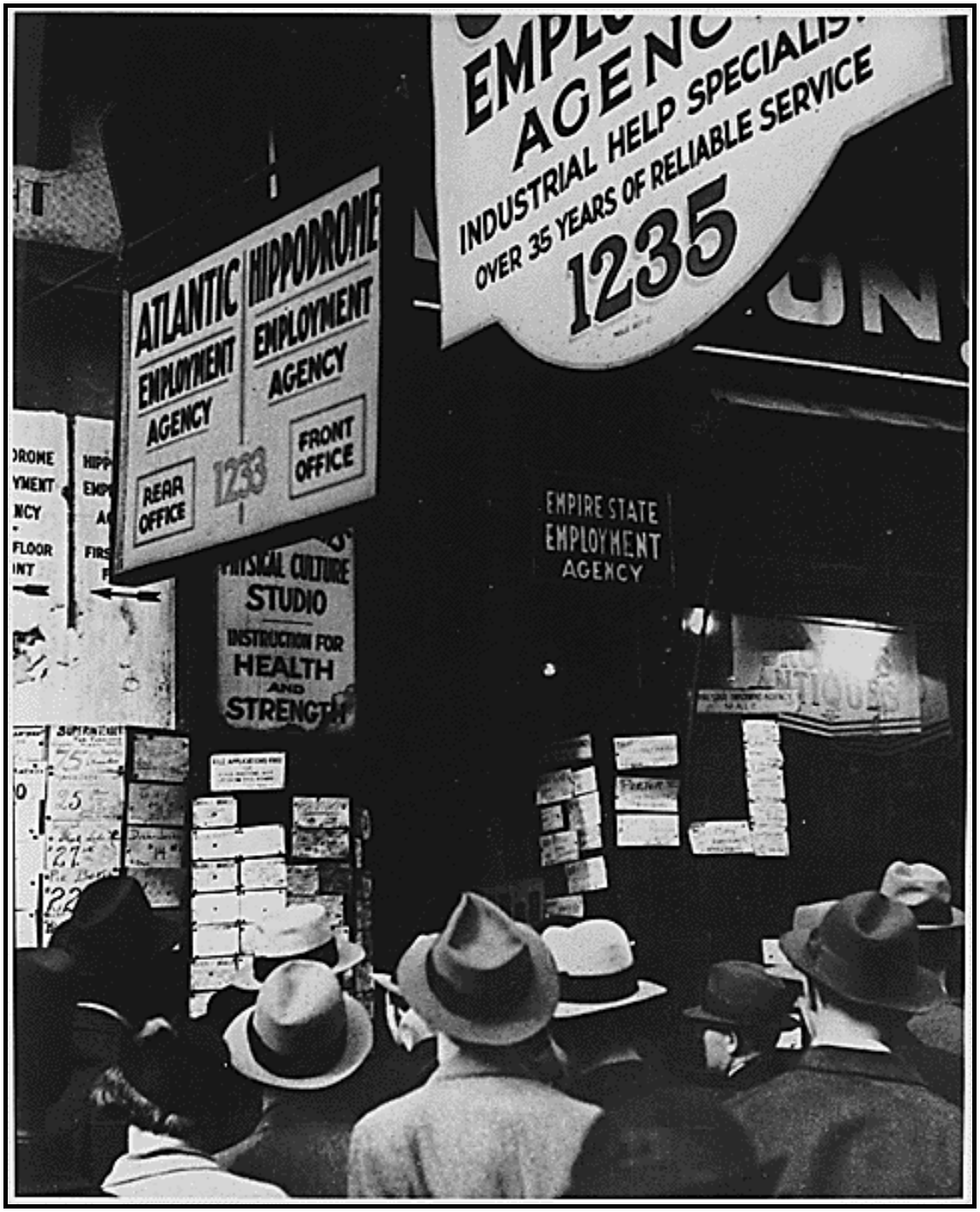


Figure 1. Unemployed: People flocked to state agencies in hopes of finding employment during the Great Depression (Photo obtained from http://about.com).[1]

Dam construction an example of what happens when the under-represented, including the dead and the ancestors who pay respects to them, have no voice in the path of 'progress' and 'economic inevitability'.

[1] http://history1900s.about.com/library/photos/blygd7.htm

Although inundation of landscape takes place in many forms, intentional inundation is a very specific topic. In no other scenario are landscapes, including archaeological signatures which make up these landscapes, *intentionally* drowned. In Arizona, the creation of Lake Powell submerged over 900 ancient *Hisatsinom* (*Anasazi*) sites (Lenihan, et al. 1981b: 7-2), destroying the structural integrity of some of the last remaining ancient Native American structures in the Western United States (see Figure 2 and Figure 3). Possibly the most politicized case of this process in the United States took place with the construction of the Grand Coulee dam on the upper Columbia River in Washington State, the largest concrete structure in the United States (see Figure 4) which displaced over 3000 people and inundated thousands of cultural areas (Ortolano and Cushing 2000). At the same time, the construction of the Grand Coulee provided a source of renewable energy and opened up thousands of acres of arid land to be farmed, allowing the Columbia Plateau to flourish. The Grand Coulee is just an extreme example of a process that has taken place for the past 80 years all over the United States. In Washington State in particular, no major rivers had been dammed in 1923 but by 2002, approximately four hundred dams (see appendix – map II) were constructed in the Columbia River Basin (Fish 2004).

Figure 2. One of 900 structurally sound *Hisatsinom* structures destroyed by the floodwaters of Lake Powell (image obtained from Lenihan, et al. 1981b: 7-23).

Figure 3. An *Hisatsinom* cliff dwelling that is now submerged (image obtained from Lenihan, et al. 1981b: 7-23).

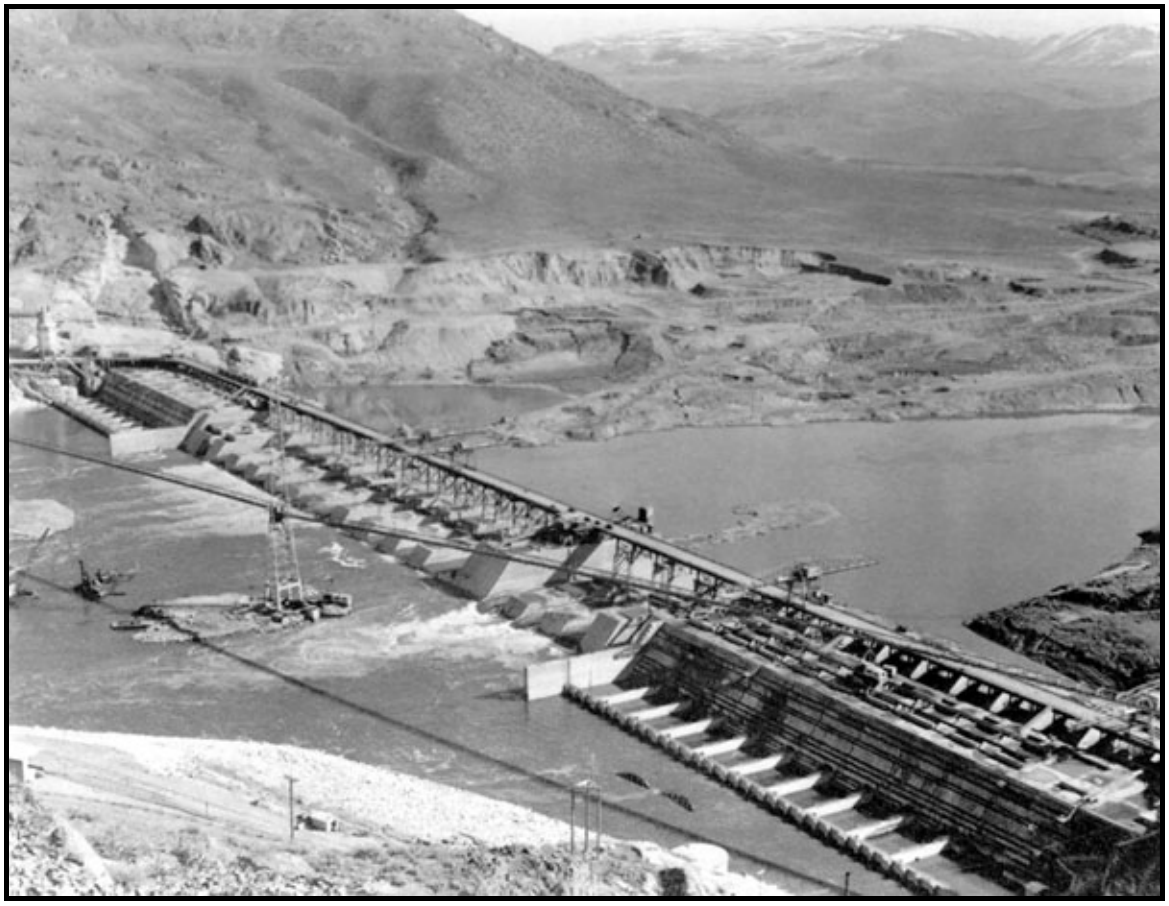


Figure 4. Constructing the base of the Grand Coulee Dam (Hubbard 2006).

This large-scale dam building process took place across the United States, fuelled by labour supply during the Great Depression and the assembly line efficiency inspired by Eli Whitney (Guelzo 2006) and later refined by Henry Ford, and was carried over into the utopianistic period of consumer modernity that dominated North American culture until the 1980s. As a result, today there are over 76,000 major dams in the United States (U.S.A.C.E. 2005).

Dam construction has now become a global phenomenon, to the detriment of archaeological 'resources' and many localized communities. The majority of large rivers on the planet have now been dammed and submerged

sites may at this point outnumber terrestrial sites in the world. Yet, after 80 years of landscape inundation, neither the government nor the public understands the long term archaeological consequences of these actions. It is often difficult to get information from the government on just what resources have been flooded. A recent Exhibit in Los Angeles by the Center for Land Use Interpretation (CLUI) contends that 'no nationwide survey of the cultural resources these sacrificed towns represent seems to exist' (CLUI 2005).

Intentional inundation, while recognized by most archaeologists as having a significant impact on scientific archaeological viability and access to land, has been studied in the past mainly in terms of physical impacts. New directions in cultural resource management (CRM) in the United States and cultural heritage management (CHM) elsewhere in the world suggest that loss of archaeological sites goes far beyond physical and mechanical impacts. Unfortunately for living people, the topic is inexorably intertwined with the politics of cultural resource management, leading to most debate over archaeological impacts remaining within esoteric government and academic spheres who have little concern for the significance of local communities and their collective heritage.

To many, submerged cultural sites are now a closed book, a historic period now overlooked and forgotten. But local communities continually yearn to re-experience these places, wish to have their children experience them. It is obvious today that federal legislation for protection of cultural

resources, the single recourse available to local communities for reconciliation and project abortions has failed miserably in its duty to local communities.

In the academy, 'underwater' archaeologists have given very biased attention to shipwrecks over submerged 'land' sites, and many more terrestrial archaeologists never take the time to learn how to do archaeology underwater. While not every archaeologist may be interested in underwater archaeology, this thesis will point out the fact that many federal cultural resource managers may have to either start doing or outsourcing this work in order to fulfil position obligations. These sites, as a consequence, have been largely neglected. This has to change - these sites need to be studied for a number of reasons, not just for archaeological research potential but also to further the positive development of human rights movements in postmodernity as the case study with the Winnemem Wintu in Chapter 5 will highlight.

This thesis analyses reports on specific archaeological signatures before and after inundation events and subsequent reflexive human behaviour in relation to these sites. These insights may provide a backdrop for future research which could lead to more inclusive decision making processes in the future regarding riverine development, and more integrative interaction with already submerged areas.

In a relativistic interpretation of the past, it is recognized that while academic separation exists between fields of study, these separations do not exist in the 'real world'. More explicitly, heritage, history, archaeology,

anthropology, and economics of everyday existence are all part of the same system in which people live. For this reason, it would be entirely negligent to talk about how cultural material is affected by inundation without talking about how people are affected. Naturally occurring human reactions to relocation and loss of access will cause archaeological signatures to vary as people move away from areas and/or change the activities taking place there.

In some cases, salvage archaeology, undertaken in an effort to save 'data' prior to inundation, may have a dramatic impact on the archaeological record. Archaeological excavation, of course, completely destructive to *in situ* artefact associations. In other cases, forced inundation may induce site erosion which would not have otherwise taken place. Finally, it could be the case that inundation of these sites offers some sort of protection. These ideas will be explored using literature and relevant case studies.

Dialougic analysis of conversations (or direct conversation in the case of project without such stringent time constraints) with those who were removed from their homes and homelands may give us insight into what sort of behaviours and responses rapid inundation events in the past may have provoked, and how these reactions may have affected the material record.

The topic of intentional inundation has been limitedly examined in relation to site formation processes in relatively stable freshwater environments. It is a point of contention amongst archaeologists interested in the topic whether archaeological sites are adversely affected by submergence (Fredrickson, et al. 1977). Many archaeologists would defend inundation as a

tool for preservation of material remains (Gates 1978; Jewell 1961). Others have found a number of detrimental effects associated with inundation, especially in long term circumstances (Carrell, et al. 1976; Foster, et al. 1977; Lenihan 1977; Lenihan, et al. 1981b; Rayl, et al. 1978). Project designs incorporating long term monitoring of submerged sites could improve understanding of issues involving conservation and destruction of material remains. A research project component of this sort may lead to surprising and enlightening results as it has on land in England during the course of the Overton Down Project (Jewell and Quimby 1966; Renfrew and Bahn 2001: 53).

Responses to inundation will vary widely. From the perspectives of the personal, community, state, corporate and academic entities, submergence of cultural landscape can mean different things. These varying perspectives must be recognized in order to understand the broader implications of waterway management and its effect on archaeology.

In many cases, Indigenous responses to 'development' that may appear to focus on the effects on a source of subsistence (or the destruction of a 'site') may be inexorably linked with cosmology. In these instances, the construction of a dam not only disturbs relationships with important historical landscapes and access to food sources, but also may have dramatic impacts on cosmological balance and spirituality. In many cases, Native American ancestral burials are now beneath many metres of water, possibly preserving these remains 'archaeologically', but taking away the ability for Native Americans to visit their ancestors. In some disturbing cases, burials which

were once stable on land are now in eroding river embankments, invoking strong individual emotional responses. These relationships will be explored more in Chapter 2.

Submergence of landscape sometimes provokes drastic community response which is exploited by the media. Dam construction has become a politically charged activity even without the public being aware of the actual effects on material remains (for a good example see Zilhao 1995). This would suggest that people are connected to landscapes as much as items within landscapes. The loss of memorial landscape can have drastic affects on human attitudes toward this type of development (Read 1996), which from a heritage context, needs to also be taken into consideration in the case of proposed dam construction. In these cases, the line between archaeology and heritage is blurred, melding past historical memory and material culture with present day rights issues.

Relevant Literature

Environmental literature surrounding the construction of reservoirs may discuss human rights impacts tends to be more recently published material (Layman 2002; Lowry 2003; McCully 2001; Scudder 2005; WCD 2001). Contemporary literature includes a number of archaeological site reports complemented by vivid pictorial and videographic documentation as well as video documentaries. Unfortunately, access to these resources is sometimes limited, and they are usually unpublished. This thesis will pull

important points from a number of published and unpublished sources and put them into a single framework, allowing future researchers to more readily access the material.

Due to the lack of previous research on the topic, it will be necessary for the purposes of this thesis to thoroughly analyse what has been written in the past. This will require a heavy reliance on particular sources, which will be cited frequently throughout the thesis. These sources are described in the following sections.

The National Reservoir Inundation Study (NRIS)

Prior to the publication of the National Reservoir Inundation Study (Lenihan et al. 1981a and 1981b), discussion of the physical and mechanical effects of site inundation was extremely limited. The National Reservoir Inundation Study by the United States National Park Service (Lenihan, et al. 1981b) was the first to address these issues using both previously documented cases and new experimental replication exercises. While the report was extremely timely, well received and important, because of time and budget constraints, no individual submerged area was studied to the necessary extent.

The report addresses the possible state of preservation of sites under the drowned banks of a number of reservoirs, with specific attention given to pre- and post -inundation processes.

The NRIS is an important stepping stone in the formation of data on the topic. What the report did not address, mainly due to the timeframe in

which it was written, was social impacts of inundation. Prior to the mid 1980s, the 'modern period' advocated a scientific view of archaeological remains which many times ignored the needs and desires of living people (Chance and Chance 1977; Smith and Weymouth 1952).

The World Commission on Dams Report

The second piece of literature that discusses submerged archaeology as an impact of dam construction is *The World Commission on Dams Report* (2001). The report summarizes information collected by Ortolano and Cushing in their USA development case study project (2000). Their findings bring to light a host of new information that was not readily accessible to the public.

The report concludes that 'in most cases [of dam construction] no measures have been taken to minimize or mitigate the loss of cultural and archaeological resources' (WCD 2001: 116). In the case of the Grand Coulee Dam (GCD) on the Columbia River, Ortolano and Cushing reported that 'between 3000 and 4000 non-indigenous people were displaced as a result of the creation of the GCD' (Ortolano and Cushing 2000: xi). Many of these settlements remain submerged behind the flood waters. About 2000 members of the indigenous community were displaced with them.

The research found that many previously submerged burial sites had been exposed when artificial lake banks eroded and slumped. 'For many tribal members the flooding and disruption of their ancestors' remains continue to be distressing' (Ortolano and Cushing 2000: 76).

The *World Commission on Dams Report* is timely, pertinent, and extremely effective in delivering a powerful message about the effects of dam construction. For this reason, it will be utilised frequently in this research.

Other Sources

Historian Peter Read has written about loss of landscape, and in his work *Returning to Nothing: The Meaning of Lost Places* (1996), Read discusses the impact of loss of land on people in Australia. While Read's arguments do not address archaeology specifically, his discussion regarding people's response to the loss of their ancestral landscapes is powerful and useful when analysing how human response might alter the archaeological record in preparation for inundation as people transform use and function of place in preparation for exodus.

Many reservoirs created by public works projects, including the Grand Coulee and Lake Shasta in the Western United States, became recreation areas controlled by the government. O'Halloran (2001) discussed the impact of a number of factors on archaeological sites in a reservoir at Lake Hume, Australia. O'Halloran's discussion was expanded into two subsequent publications which looked more specifically at impacts of human induced wave action on archaeological sites (O'Halloran and Spennemann 2002), and impacts of recreational boating and fishing on sites (O'Halloran 2002). These articles are of course relevant in any cases where modern human rubbish may disrupt archaeological stratigraphy, or where, in a more emotionally loaded

scenario such as in Lake Shasta, California, inundated sacred sites are being polluted by recreational activity in the reservoir.

Due to the political nature of the topic, popular literature and popular media will be an important source of information for this thesis. Popular media and digital representation is also the most feasible way for underrepresented groups to assert their rights. Indigenous digital media (Fish 2005a) and local media sources are important ethnographic tools for archaeological interpretation in the 21st century.

National Geographic has highlighted the detrimental environmental effects of the dam's construction in the past. Tied into this is the loss of salmon runs which have sustained indigenous populations for over 10,000 years in North America (Montaigne 2001). Numerous newspaper articles, websites and environmental activist brochures also highlight the detrimental social impacts of dams. Others praise these dams for the power and water they provide. Popular sources are valuable pieces of documentation which emphasise the human struggle behind the issue of lost cultural landscapes.

All of this literature emphasizes the effects of dam construction. While this thesis focuses on archaeological impacts, discussions of politics, environment and heritage will play key roles in the development of an argument for better management of these sites, and may help to develop a better framework for decision making in the future.

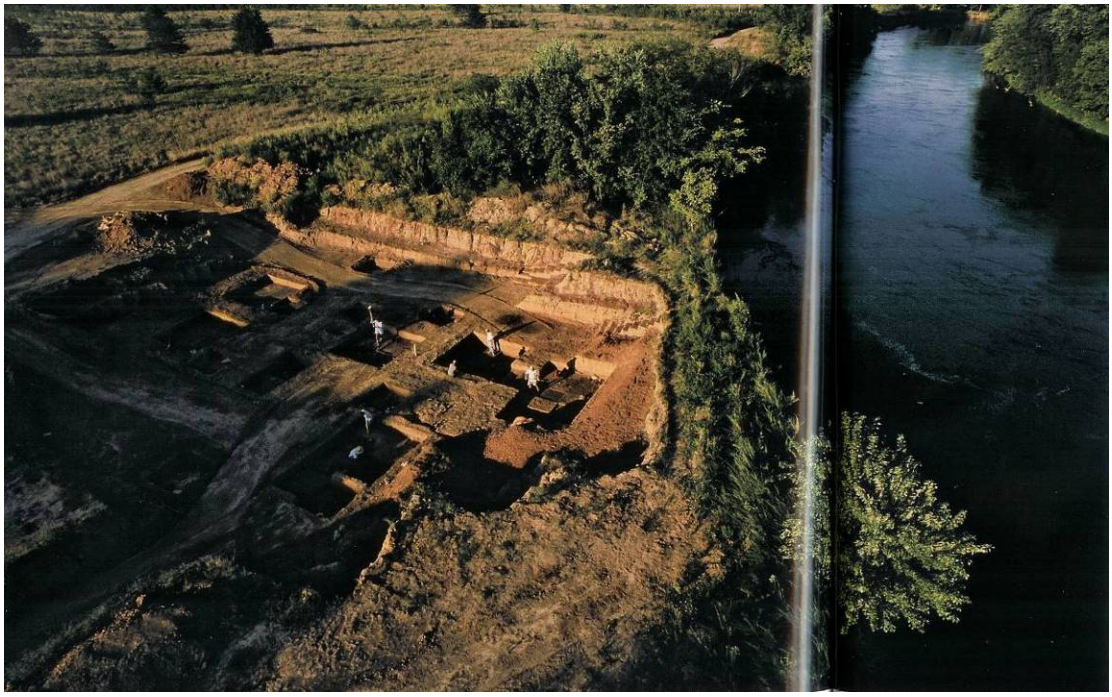


Figure 5. A large-scale excavation funded by National Geographic in an area which will be flooded (photo adapted from Barnes 2005:94).

Chapter 2: Multivocal Frameworks and Perspectives

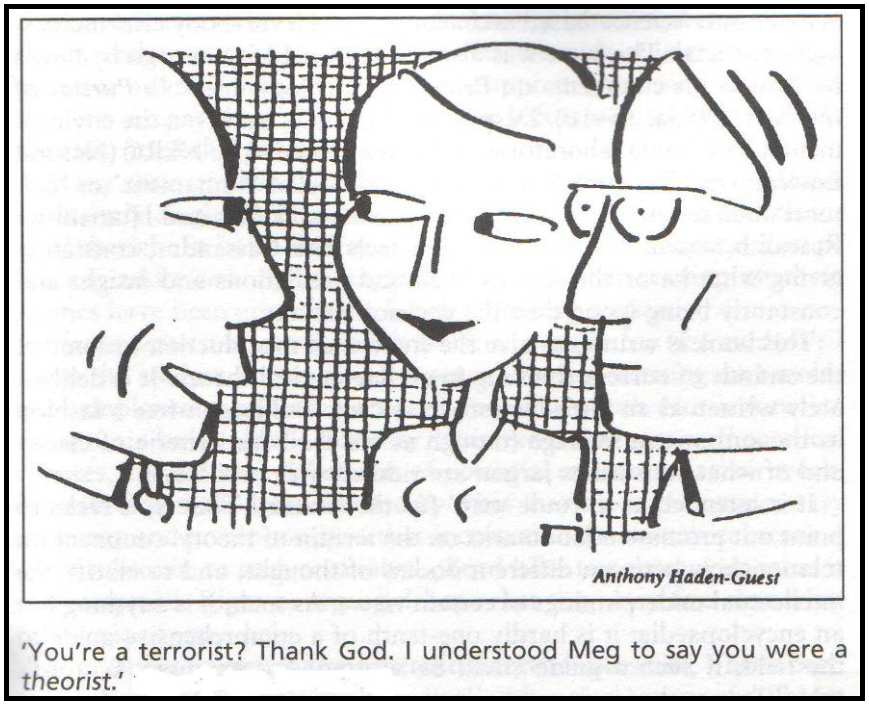


Figure 6. (Adapted from Johnson 1999: xi)

Explanatory Framework and Methodology

This research encompasses a wide range of approaches in order to achieve the goal of rearticulating the nature of 'reservoir archaeology' or 'limnoarchaeology' (Lenihan 1974a: 28, 1974b) in the United States. Most of the archaeology in question was conducted in the 'culture-historic period' in the U.S. from 1910-1960 (Trigger 1984: 356), before the rise of the 'new archaeology' which propounded scientific processes (Renfrew and Bahn 2001: 38). Approaches in this paper will include both scientifically-based perspectives, as well as interpretive archaeological explanations and arguments (Hodder 1986; Shanks and Tilley 1987) to achieve true

multivocality, and hopefully lending voice to the living as well as the dead (Dening 1996).

The thesis will also use terms such as *cultural landscapes* (see Chapter 3), *cultural areas*, and specific site descriptions when possible to describe affected locales. The reason for this is simply that in using a term such as 'archaeological site', we impose a scientific value on these places while unintentionally devaluing the importance of these places to living people who may not view these places simply as an area of study. Archaeology should aim to work with the public on multiple levels, and to different groups in order to extract true multivocality from historically sensitive areas. This is the approach known as 'community-based archaeology' (Greer, et al. 2002).

Part VII, a case study on the inundation of traditional Wintu territory near Mt. Shasta, California (Figure 7), will rely on recent communication undertaken by the International Centre for Archaeology Underwater, media exploitation, and the *Sacred Land Film Project* by Christopher McLeod titled *In Light of Reverence* (2001), a filmic example of 'indigenous digital media', which works to empower native communities through community control of information production and dissemination (Fish 2005a).

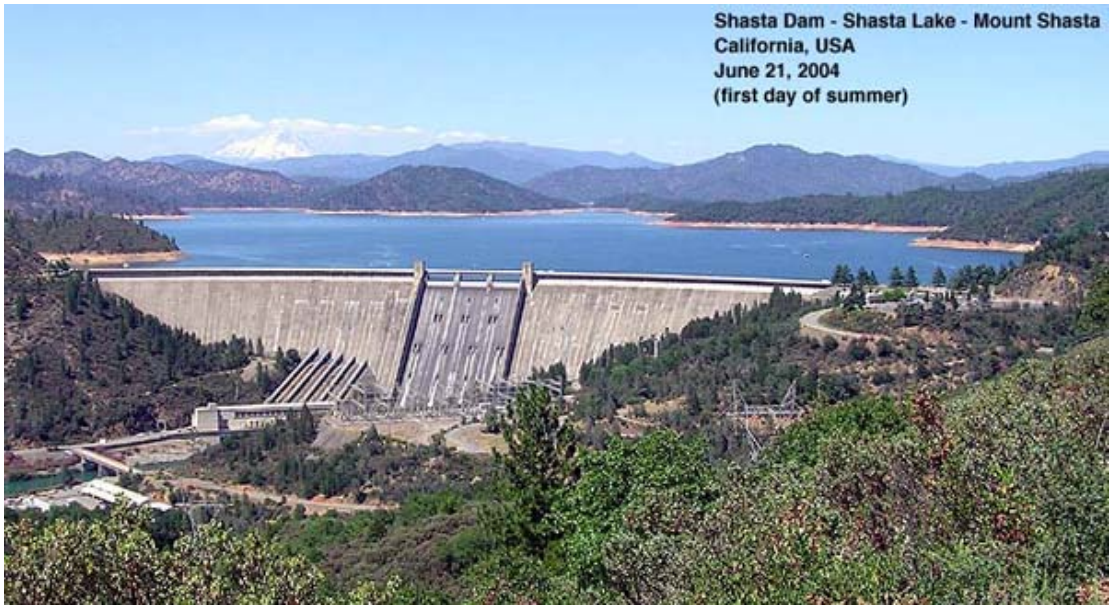


Figure 7. The Shasta dam completed in 1944 submerged hundred of sites sacred to the Winnemem Wintu people. The reservoir is now a large recreational area (Image obtained from www.shastalake.com).

Is This Maritime Archaeology?

Maritime archaeology, in its most broad context, would include both the study of maritime 'sites' as well as maritime 'cultures'. While either of these terms could be contested, it is largely accepted that maritime archaeology, as well as underwater and nautical archaeology, require no special treatment theoretically.

In fact, some of the most prominent organizations in the world including Mexico's elite underwater archaeology team at the *Instituto Nacional de Antropología e Historia* do not acknowledge a distinction between terrestrial and underwater archaeology other than in difference in techniques utilized (Luna 2005). As George Bass once stated in Richard Gould's now famous book *Shipwreck Anthropology:* 'archaeology under water, of course, should be called simply archaeology' (Gould 1985).

During the course of this research, no effort was made to define the work as specifically underwater in nature except to highlight the disparities between archaeological treatment or acknowledgment of cultural areas.

Cultural Resource Management & Salvage Archaeology in the Western U.S.

In this thesis, an attempt is made to move 'beyond' traditional cultural resource management (CRM) in the United States. Generally, CRM is defined as being an enterprise that 'locates, evaluates, and studies cultural resources including archaeological sites…' (Green and Doerchuk 1998: 122).The problem with this definition is that is treats 'archaeological' sites as commodities to be rationed and evaluated in terms of (usually) Western ideas of importance or value. A broader view may see that 'cultural resource management needs to be a great deal more than archaeology, or architectural history, or folklife, or historic preservation. It needs to deal with management of the whole cultural environment, and the effects of contemporary plans and decision on that environment in all its aspects' (King 1998: 9).

Cultural resource management, while it has many shortcomings, is an integral component of the field. As anthropologist Laurajane Smith has stated, 'it is explicitly through the day-to-day processes of CRM that archaeologists encounter other groups and interest who may perceive the *cultural resource* not as data but as *heritage*' (Smith 2004: 2 - emphasis added). Unfortunately, while heritage issues, such as attachment to place, are sometimes recognized,

they rarely hold much weight in negotiations over reuse or redevelopment of an area unless there is money to be made by keeping a site intact.

The large scale dam building process goes far beyond simple economics, beyond the Cost-Benefit Analysis (CBA) that economists will argue validate the 'necessary' disruption of connection to land and severing of landscape association. The 'power' that dams provide is a double entendre in the classic sense. While the dam may provide water, power and jobs (resources) to the community, it may take away land, access to land and sever attachment to place (all respectively also viewed as resources under the framework of cultural resource management). Under this framework, it is simply not economically feasible to consider *not* building the dam.

As pointed out in the World Commission on Dams Report, indigenous populations are often one of the most heavily impacted groups in the case of dam construction (WCD 2001: 110-111). Indigenous groups, who in some cases resist assimilation, therefore depriving the state (and assumedly its majority populace) of valuable resources, must either be silenced or assimilated. Since we have thankfully moved out of the colonial genocide era here in the United States, a new tactic must be utilized.

Indigenous identity is many times intimately connected with landscape (McLeod 2001), and 'archaeology, as a privileged form of expertise, occupies a role in the governance and regulation of identity' (Smith 2004: 3). It has been a long recognized policy of the United States to force assimilation by removing people from that landscape, leaving a 'gap' in self-perception which can then

be injected with Christian and American religious/nationalistic ideologies. It is not a far stretch to realize that dam construction, while providing resources for the 'greater good', conveniently removes indigenous people from their landscapes, continuing the process of assimilation that was begun with the initial Spanish incursions into North America. Anthropologists Anthony Oliver-Smith has summed up this concept up beautifully in the following:

> In many respects, dam-induced resettlement will not necessarily destroy "local cultures" as much as it appropriates them and restructures them in terms of values and goals often originating from far beyond the local context. Such a process involves the reduction of local culture, society and economy from all their varied expressions to a narrow set of institutions and activities that make them compatible with the purposes of the larger society (Canclini 1993) [referenced in Oliver Smith 2006].

In many cases, so much money can be made from development of areas, such as with the Grand Coulee Dam in the state of Washington, that dissenters can be easily silenced by simply paying off those who object most strongly (Ortolano and Cushing 2000: xiii). In most cases, room for public objections to culturally detrimental projects is left until the last minute, which many would consider simply a tactic by 'developers' to keep the public appeased (See Figure 8). These openings for public comment rarely have an effect on the projects commencement.

Better definitions for the term CRM have been suggested by authors such as Thomas F. King, who sees a CRM philosophy which does not embody 'the social institutions, beliefs and lifeways that give each [archaeological] system its unique identity' (King 2002: 6) as entirely problematic.

Alternatively, it may become most effective to abandon the term *cultural resource* in favour of *cultural heritage*, which is defined by the United Nations Educational, Scientific and Cultural Organization (UNESCO) as 'all distinctive, spiritual, and material intellectual and emotional features which characterize a society or a social group' (UNESCO 1998).

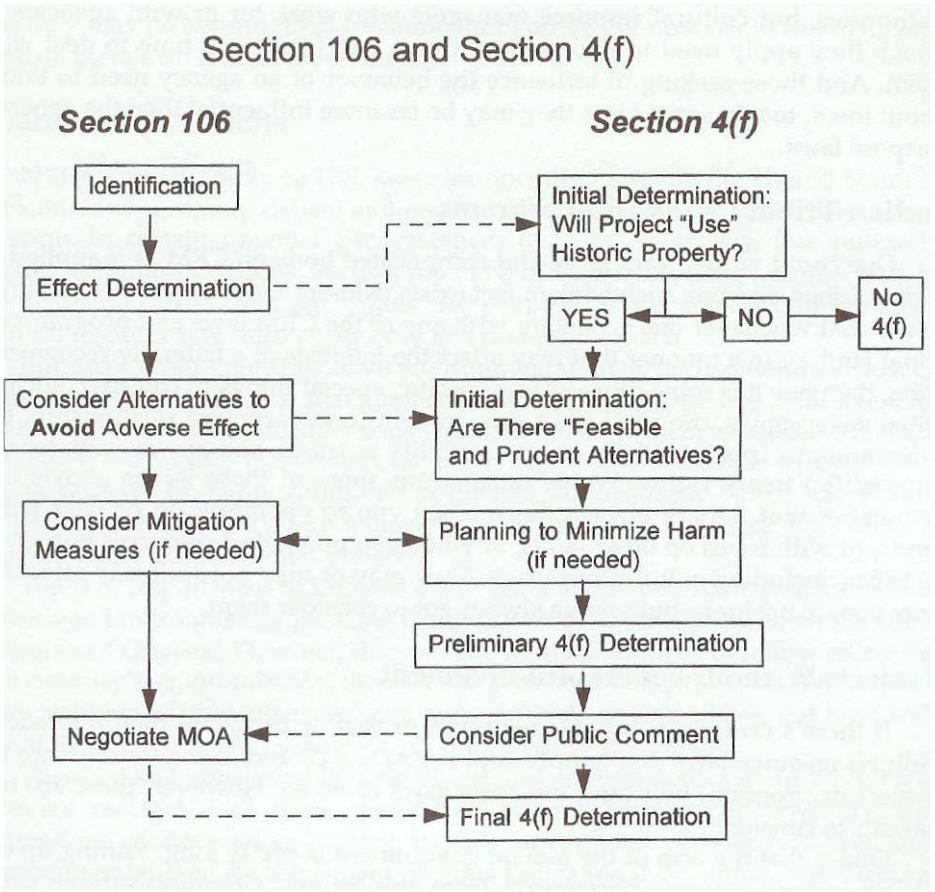


Figure 8. The Section 106 process (figure adapted from King 1998: 213)

This point of view helps us to move past empirical systems of knowledge and historical 'document' or 'artefact', by recognizing that 'scientific knowledge does not constitute a privileged view of the past that in

and of itself makes it better than oral traditions. It is simply another way of knowing the past' (Anyon, et al. 1996).

The Reservoir Salvage Act of 1960

In the United States, archaeologists were largely operating in a legislative vacuum as far as archaeological protection until the passage of the Antiquities Act of 1906, [2] which extended protection to cultural resources on a very basic level. Regardless of the fact that this act was passed, large scale government projects, including dam construction had an absolutely devastating impact on cultural environments in the Western United States. This led to the passage of the Reservoir Salvage Act of 1960, [3] which provided for 'the preservation of historical and archaeological data that might otherwise be lost as the result of a federal construction project or a federally licensed or assisted project, activity, or program having an effect on cultural resources' (B.L.M. 1997).

The passage of this act created a dramatic increase in the type of work that was to become cultural resource management. As a result, hundreds of reports (generally unpublished) were written by government, academic and contract archaeologists in which cultural sites were excavated quickly, a process known as salvage archaeology, and now sometimes called 'data recovery' prior to inundation (Chance and Chance 1977; Gates 1978; Treganza 1954; Treganza 1958). There were few cases of very good archaeology being

[2] http://www.cr.nps.gov/local-law/anti1906.htm
[3] http://www4.law.cornell.edu/uscode/html/uscode16/usc_sec_16_00000469----000-.html

done prior to flooding (Anderson, et al. 2006), but few, if any, of these results stopped dam construction from taking place.

In most cases, salvage archaeology prior to inundation may have dramatic negative impacts on archaeological sites, with archaeological 'data' collected without research direction and/or social and cultural contexts. Inundation is also in some cases utilised as an excuse for archaeologists to excavate sites which would not normally be accessible or acceptable to excavate. This sort of salvage work, which tends to test a limited and narrow set of strictly defined hypotheses looking for factors of 'significance', is not usually reflexive and is may be in conflict with wider public interest (Hodder 1986: 170). A good example of this is work undertaken by David and Jennifer Chance (1977) at the Kettle Falls region of the Columbia River. These excavations, while they yielded a great deal of disconnected archaeological information, would likely never have been approved by the traditional owners if the threat of looting and destruction due to erosional processes (an effect of dam construction) had not been emphasised (Figure 9).

Although the archaeological excavation process is destructive, it is a better alternative than the complete loss of information. The simple fact is that in most cases of proposed dam construction worldwide, 'no investigation of cultural or archaeological resources [have] been a part of the planning process' (WCD 2001: 116).

This was apparent in the United States during the large scale dam construction projects of the early 1900s and throughout the great depression

when the creation of jobs, not the preservation of cultural resources, was the national priority.

Like in the instance of Kettle Falls, forced inundation may cause site erosion which would not otherwise have taken place. On the banks of the Grand Coulee, Native Americans express deep concern today when water levels drop and their ancestral remains are exposed.

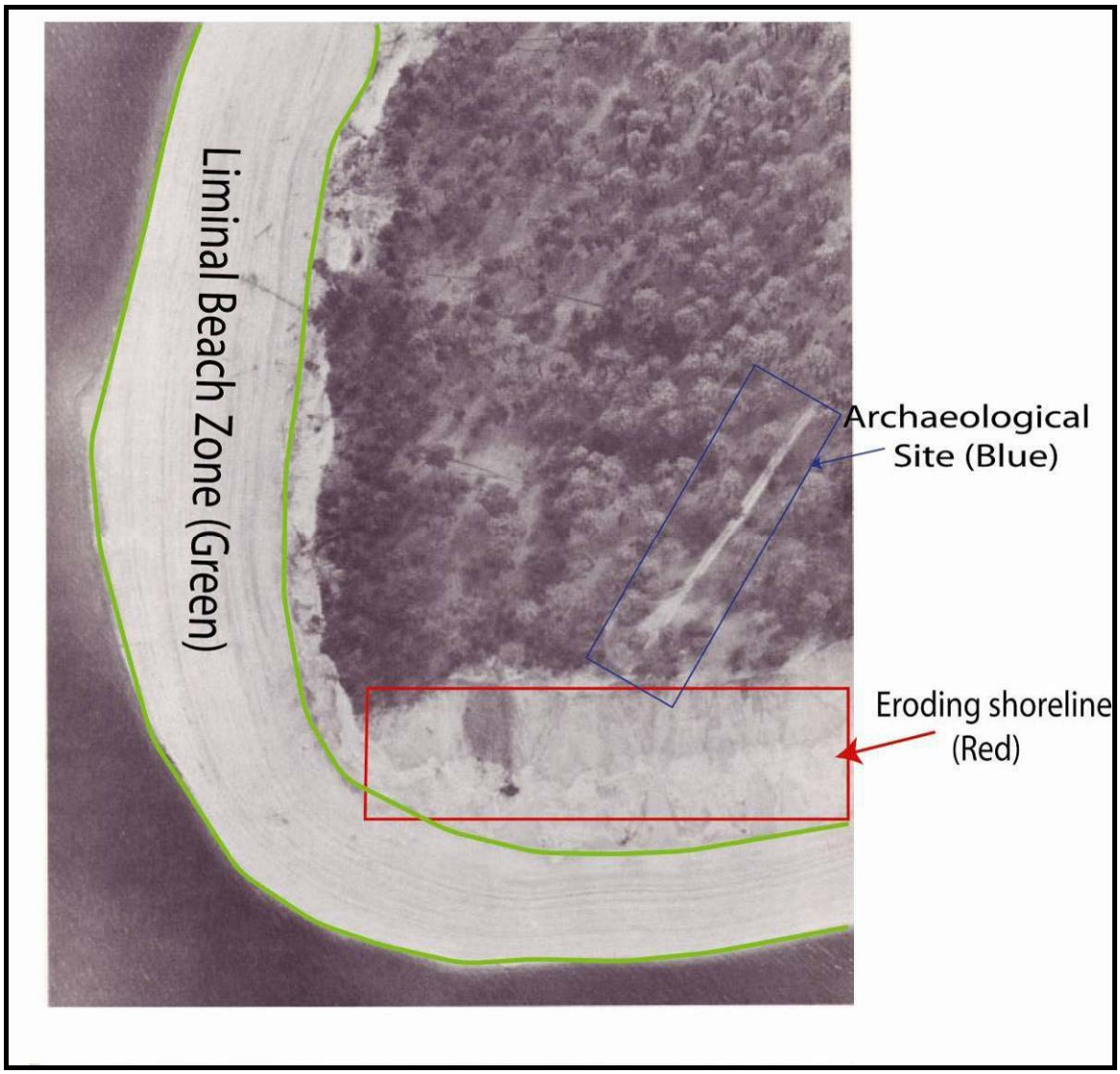


Figure 9. An archaeological site being eroded at the new shoreline at Kettle Falls (image adapted from Chance and Chance 1977).

In the recent Grand Coulee Dam case study, many tribal members found 'the flooding and disruption of their ancestors remains…distressing' (Ortolano and Cushing 2000: 76). The authors go on to state that

> As the primary habitation of tribal peoples for over 10,000 years, the river valley and banks contain numerous culturally and archaeologically significant sites that have been lost or seriously damaged by inundation. In the 1930's, preservation of these sites was not a high priority for the federal government [Ortolano and Cushing 2000: 76-77].

Although some things have changed for the better in federal cultural resource management since its inception in the 1970s with the implementation of the National Environmental Policy Act of 1969 (NEPA), [4] similar detrimental effects still take place. It is important in the future that heritage issues are given full consideration in light of the devastation the reservoir construction has caused in the past and present.

Cultural Heritage Management - A Sense of Space, a Sense of Place

The idea of heritage, discussed earlier in this chapter, is one of expansion. It is an expansion in our understanding of what is viewed as significant, in what is viewed as sacred. A shift into the concept of 'heritage' rather than 'resource' is a broadening of agendas, a collective acknowledgement that culture is not a resource, and that culture certainly extends beyond material goods. Heritage has been described as:

> a nomadic term that travels easily… It sets up residence in streets broad and narrow, royal palaces and railway sidings… It stages its spectacles in a promiscuous variety of

[4]The NEPA can be viewed at http://ceq.eh.doe.gov/nepa/regs/nepa/nepaeqia.htm

> venues, turning maltings into concert-halls, wherehouses [*sic*] into studio flats… [Hutter and Rizzo 1997].

In the case of dam construction, adding a heritage aspect to the mitigation procedure forces one to analyse not just physical impact of the event, but also social impacts.

Peter Read (1996) has discussed the social impacts of loss of landscape in great detail. In interviews with those who had lost access to their homes due to inundation, and in interviews with the 'developers' who had been involved in the inundation, Read found great interest in the language used by the developers when they explained that 'it was necessary for the dam builders to commence, as if the bulldozers obeyed some natural phenomenon like gravity. [The developers] referred to the loss – not destruction – of the old town, the changeover and the smooth transfer to the new, as the old one submerged – not died' (Read 1996: 82). In a powerful example of the relevance of landscape approaches to submerged landscape, Read speaks with Alan Lucas, a resident of a now submerged town who spent the town's last days driving around the area, watching his historical memorial landscape go under the fresh water.

> One day Alan passed the half-wrecked cinema, once the pride of the Latrobe valley. It was there he had his first date, where he saw *Midnight Cowboy* and *The Godfather*. He clamoured over the wreckage and souvenired a copper number from the back of one of the seats [Read 1996: 91-92].

Many of these sites go unrecorded. Amistad Lake in Texas began impounding waters in 1969 (Lenihan and Brooks 1998: 152), submerging 10,000 years of history including an old ranch house (See Figure 10). In the

case of the Columbia River, loss of access was, and is, a major issue. Firstly, loss of ancestral salmon runs were devastating to the people of the area on a number of levels. On a subsistence level, a major food source, used for at least 10,000 years, was taken from Native American People. On a cosmological level, the salmon runs were a symbol of wealth, well being and prosperity among Pacific Northwest Coast Native Americans (N.E.A. 1996). The loss of the salmon shifted the entire world view of a people, and obviously had a dramatic impact on the archaeological record. A stratigraphic profile which was rich with salmon bones and spear points for 10,000 years was replaced by aluminium cans and plastic waste of recreational reservoirs almost overnight (Montaigne 2001).

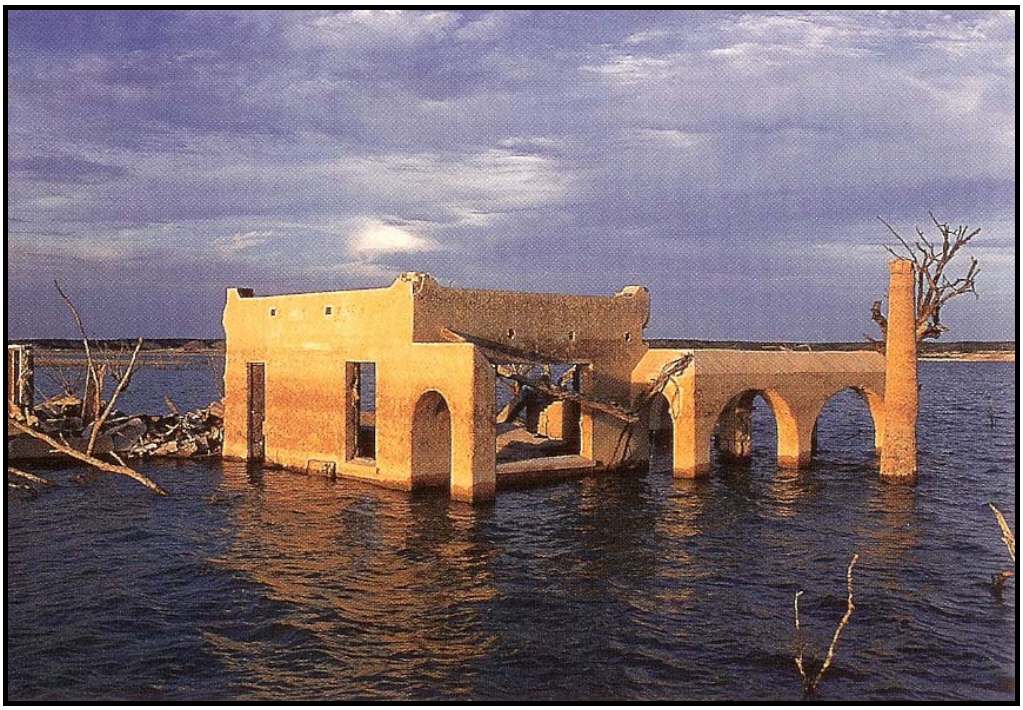


Figure 10. Lake Amistad in Texas submerged a number of cultural areas including this ranch house (Photo obtained from Lenihan and Brooks 1998: 153).

Underwater surveys with proper multimedia documentation such as photographs and video serve a more significant purpose than just scientific recordation. These techniques can become the tools people use to rediscover and reconnect with their own landscapes. These technical possibilities enrich not only archaeological interpretation, but also help people to deal with the loss of culturally significant areas. In these scenarios, the archaeologist steps into the role of the heritage manager.

Moving into the realm of heritage management is an important next step for archaeologists in the United States. Throughout the next four chapters, it will become apparent that inundation of landscape is a complex issue which requires a broad view of what constitutes archaeology, and gets to the heart of why cultural values and attachment to memorial landscape are so important in a rapidly transforming modern society.

Chapter 3: Physical and Mechanical Effects of Inundation on Archaeological Remains: Controls and Site Formation

Physical Effects of Inundation: Time Capsules or Aquatic Bulldozers?

The time capsule 'freezing' of occupation sites, brought on by floodwaters is one of the rare instances where archaeology is 'created' almost instantly. From an archaeological perspective, submerged sites, undisturbed in a reservoir, may capture a moment in everyday life of a particular time, even down to the day of impoundment, similar to a shipwreck event. Also, similar to a shipwreck, impoundment may capture a moment of panic as this disaster transpires. Finally, just like shipwrecks, terrestrial sites were never meant to be underwater. This scenario inevitably brings up questions regarding the integrity of these sites, questions about how they react to their foreign underwater environment.

Until the 1980s it was unknown whether sites were being preserved, eroded, or completely destroyed behind dams, leading one author to suggest that this would be an important area of study (Jewell 1961). It was noted that in the 1970s, writers of environmental impact statements were basing their impact assessment for archaeological impoundment on entirely contradictory assumptions (Lenihan, et al. 1981a: 11).

The National Reservoir Inundation Study (NRIS) undertaken by National Park Service attempted to address this hypothesis over 20 years ago by sending underwater archaeologists around the United States to monitor what happened to sites post-inundation. This was complemented by

experimental replication studies in which both archaeological and fabricated material were submerged in artificial environments. The project was a landmark in underwater archaeology, the first published work that attempted to assess the nature and impact of freshwater inundation on cultural areas. The results of the 1000 page report (Lenihan, et al. 1981a, 1981b) are summarized below.

General Physical / Mechanical Impacts

In the NRIS, it was concluded that reservoir sedimentation enhanced protection for cultural resources by acting as a buffer against biochemical and mechanical impacts (Lenihan, et al. 1981a: 47). However, sedimentation also results in loss of access to sites, and a diminished ability to monitor site integrity, limiting management strategy options and creating greater division between the archaeologist and the public in some cases (see also Chapter 4).

Increased sedimentation, the destruction of valuable endemic biological resources including plants and animals, and the creation of the submerged environment are all inevitable outcomes of reservoir construction, leading to irreparable chemical alteration which can degrade quantitative scientific information, and limit the range of possible historical interpretations. These could include changes in the nature of soil, destruction of pollen and seed information, or even changes in the chemical nature of specific artefacts which could have been analysed. Organisms which thrive in the underwater environment, especially in the beach zone, may burrow into soil, a form of bioturbation which could increase damage to culturally

sensitive areas. Overall, soil type, temperature, moisture, aeration, and pH are affected by inundation (Lenihan, et al. 1981a: 147). These factors must be taken into account when assessing reservoir construction impacts.

In long term cases of inundation where resources are submerged in deep water, the physical underwater environment may become anaerobic, thus helping to preserve organic materials such as timber (Delgado 2001: 243; Gould 2000: 2). This is a common occurrence in stable, even stagnant, submerged freshwater environments such as caves (Cockrell and Murphy 1978).

The effects of inundation on archaeological dating methods is poorly understood, mainly due to the lack of long term information regarding effects. In short term contexts, it was found that 'absolute dating based upon C-14, obsidian hydration, archaeomagnetic, fission-track and alpha-recoil dating are not compromised, although the latter two are affected by uranium-rich soils' (Lenihan, et al. 1981a: 198). Thermoluminescent dating accuracy was found to be heavily impacted by inundation. Lenihan has also suggested that obsidian hydration dates would be obscured by long term inundation (+20 years).

Finally, the report concluded that while archaeological resources in the deeper waters of the reservoir may have increased psychical protection, cultural material in shallow zones, especially along shorelines, incur a great deal of damage. In many cases, dams may be drawn down, and water levels may fluctuate, leading to the destruction of sites over hundreds of meters of traversing shoreline. As Lenihan (1981a: 97) points out, 'High energy waves,

the most destructive form of mechanical impacts in reservoirs, are essentially restricted to the beach-zone band, the width of which is determined by pool-level fluctuation' (see Figure 11). When a reservoir is initially filled, the time it takes to fill is a key component in relation to site impact.

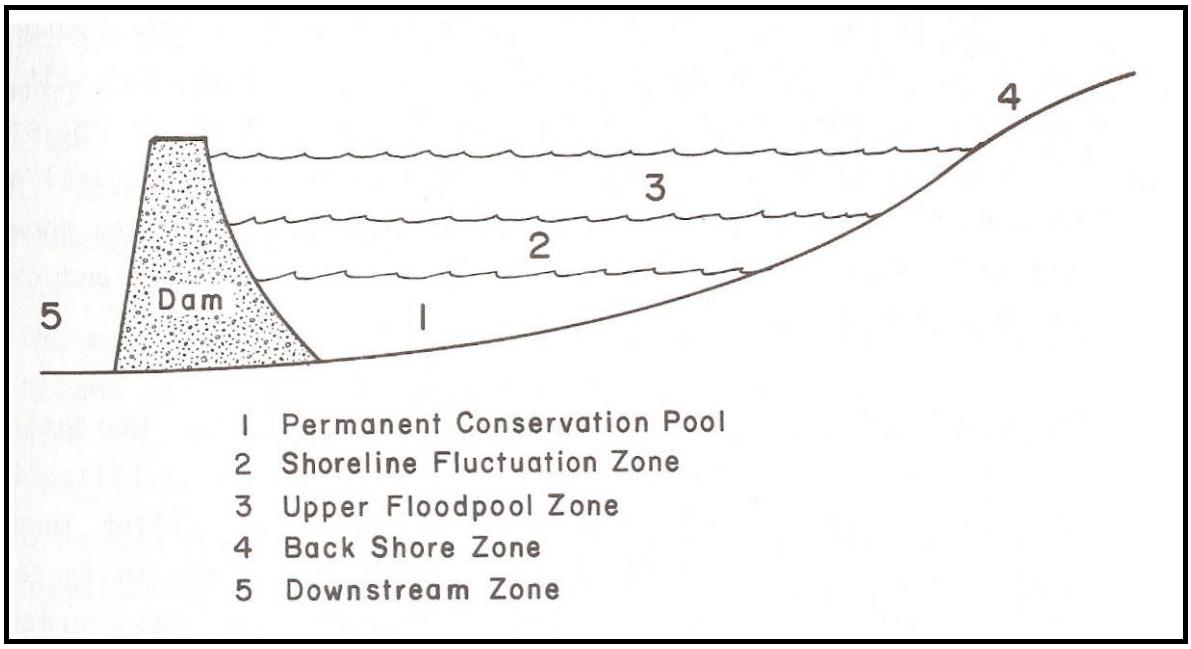


Figure 11. National Reservoir Inundation Study chart showing the different dam zones (adapted from Lenihan 1981a: 209).

In areas such as Lake Powell in Utah, the reservoir fill was so slow that some cultural areas were subject to days or weeks of wave and wind erosion before they were submerged (Rayl, et al. 1978). This was noted by researchers working in Bluestone Reservoir in West Virginia where the report states that 'A site located near the shoreline will be subject to mechanical erosion...with resultant loss of artifactual materials' (Adovasio, et al. 1980). At Lake Roosevelt in Washington, Archaeologist Lester A. Ross noted that 'physical effects of annual lake level fluctuations and drawdowns upon archaeological sites are generally manifested in two ways – erosion and deposition' (Ross

1969: 3). Ross notes that while sites are being lost through both processes, erosion at the shoreline fluctuation zone was highly destructive.

These problems may be exacerbated by recreational activities in reservoirs which cause an increase in wave activity (O'Halloran 2002). These areas, as a consequence, become more susceptible to vandalism as cultural remains are exposed by unnatural wave erosion (Ross 1969: 5).

Specific Artefactual Impacts

As previously mentioned, prior to the NRIS, it was unknown what effects inundation had on specific cultural material. The study dealt with this problem in two ways. First, pre- and post-inundation site monitoring took place on a number of projects. Second, experimental submergence of artefacts was undertaken, a variant of experimental archaeology. While these experiments yielded important information, they were mainly short-term. Real benefit would have been reaped from long-term monitoring projects to understand all the effects of inundation.

The NRIS divided artefacts into specific categories; ceramics, lithics, shell, wood, and bone were analysed. The experiments were an attempt to 'investigate the relationships between freshwater biochemical variability and the deterioration rates of common cultural materials' (Ware, et al. 1979: 3-1). In a separate report, Larry Nordby carried out similar studies on the structural integrity of submerged ruins (Nordby 1980). These findings, including Nordby's report, will be summarized here. Additionally,

information on the effects of inundation on rock art will also be included in the discussion, though this was not included in the NRIS.

Ceramics

Experimental ceramics were made using different material, fired at different temperatures. These were then submerged in freshwater and analysed at four, eight and twelve month intervals. It was found that ceramic fired below 600°C were completely destroyed after only four months of immersion (Ware, et al. 1979: 3-7). The report went on to show that ceramic fired at a higher temperature maintained improved physical structure, but all samples were affected to some degree by inundation. Changes in water chemical environments seemed to have little impact. The research also concluded that tempered ceramics generally did not survive as well. This study did not take many mechanical factors into account (such as wave impact on ceramics) which could have dramatically changed the results.

Lithics

Most of the samples chosen for this experiment were flakes or tool production waste, as this is a common component of older cultural areas in North America. The study found that 'after twelve months of immersion, no obvious qualitative changes were observed on the flakes' (Ware, et al. 1979: 3-38). Again, while this is useful information, the experiment could have been expanded to study the effects of water wear and erosion on milling stones such as metates and manos, the loss of blood residue information on tools or

even the obscuring of evidence of wear due to long term wave polish, especially in the high impact beach zone.

Shell

Significant change in the physical nature of shell was recorded during the experiments. This is surprising given that immersion of shell may return it to an equilibrium from which it was removed during historic times. Unfortunately, chemical levels of reservoir zones differ often from natural freshwater environments. It was found 'that acidic water solutions may be highly destructive of artefactual shell after only short periods of inundation' (Ware, et al. 1979: 3-47). And generally, short term immersion of both oyster and clam shell is subject to considerable calcium leaching which may obscure archaeological 'data'. The ability to use shell as a source for radiocarbon dating purposes may also be compromised by the mineralisation of material after a period of submergence.

Wood

Wood was not found to be significantly affected by immersion. Freshwater environments tend to stabilize wood, including shipwrecks, more efficiently than salt water immersion (Lenihan and Brooks 1998: 163). This information, gathered from many shipwreck sites around the world, can be applied to reservoir environments which may include structural features such as housing timbers.

In certain cases, wood found in proximity to submerged freshwater sites can be used to date flooding events. Pioneer work by Charles Dortch

(1990) in Western Australia has proven the effectiveness of these techniques. Dortch used submerged blackboy stumps (grass tree or *xanthorrhoea australis*) to make assumptions regarding the last possible occupation date at an Aboriginal quarry in Lake Jasper. In another case, submerged tree stumps have been used in Lake Tahoe, Nevada, as indicators of mid-Holocene aridity indicators (Lindstrom 1990). These stumps yield valuable information concerning past environmental reconstruction. It is likely that without submergence, this information would not be available.

Conversely, wood in the liminal beach zone which is subject to periodic flooding and recession may be destroyed quickly through the chemical processes of saturation and evaporation as well as mechanical processes of wave battering.

Bone

The experimental research on bone concluded that 'under extreme conditions of acidity, bone will probably not withstand the impacts of prolonged inundation' (Ware, et al. 1979: 3-51). In all cases of bone submergence during the study, negative impacts were recorded. Again, these impacts are extremely heightened in shoreline erosional zones. The physical impacts of inundation on bone is the most important component of this study, as the results apply both to human and animal bone, going far beyond 'physical' implications and evoking emotional response.

Generally, the NRIS concluded that the 'the overall effects of reservoir construction on archaeological resources in any given drainage area are

unquestionably detrimental in nature' (Lenihan, et al. 1981a: 4). Unfortunately, while the report touched on social impacts, it failed to address the social performance of dams as defined by the World Commission on Dams Report (2001). These concepts could have been explored in the course of the research to complement the discussion on physical impacts. The report also would have benefited from the continuation of long term experimental inundation studies.

Effects of Inundation on Masonry Structures

Experiments involving the experimental preservation on *Hisatsinom* structures (permanent brick and mortar pre-contact houses in the American Southwest) took place behind the dam at Lake Powell, Arizona (see Figure 12 and Figure 13). Over 900 *Hisatsinom* sites were inundated by the construction of the dam, many of them containing housing structures. Larry Nordby, a NPS archaeologist, found that '...inundation results in complete mortar dissipation by softening and separating the component soil particles. As the plastic and liquid limits of these mortars are exceeded, the weight of the stones causes the wall to topple, even in the absence of current or wave activity' (Nordby 1980: 7-3) (see Figure 12 and Figure 13 for examples). Nordby's findings are extremely significant given the scarcity of semi-permanent native structures in the archaeological record of the Southwest United States.

Nordby experimented with stabilization efforts both pre and post inundation, but attempts at maintaining structural integrity after the

inundation event were relatively unsuccessful. Unlike artefacts that can be repatriated outside of floodwaters during the process of 'salvage archaeology', structures cannot be relocated without disrupting the cultural fabric and landscape integrity in which they were created (Aplin 2002: 71-72) and deserve special consideration.

Effects on Pictographs and Petroglyphs

The National Reservoir Inundation Study did not incorporate a study of the effects of submergence on pictographs and petroglyphs, although known petroglyph sites were within a number of areas under study. However, William Layman (2002) examined this problem on the Upper Columbia River. Layman shows that petroglyph sites in Shookumshuck Canyon, Spanish Castle, Crescent Bar were inundated behind the Wanapum Dam (Layman 2002: 38-39). Layman includes in his research a map of Picture Rocks Bay (see Figure 14), which was also inundated by the Wanapum Dam.

Layman does not specifically address the physical effects that inundation has caused, his work in mainly a pictorial narrative, but it is obvious from the effects on other materials that sensitive petroglyph and pictograph sites will be highly susceptible to erosion, especially at the fluctuating high water mark. More importantly, access to many of these areas is now cut off by floodwaters. While it is possibly that paintings and engravings could be preserved by inundation, this situation is most likely hampered by the chemical processes discuses earlier in this chapter.

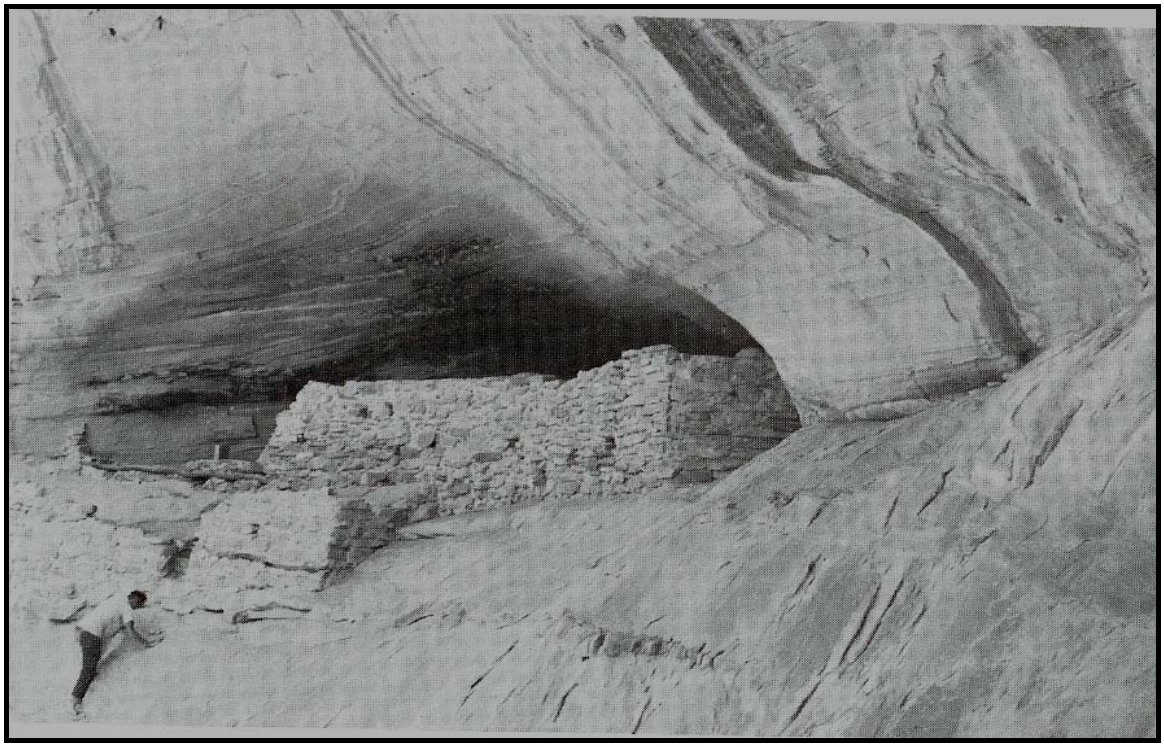


Figure 12. An *Hisatsinom* cliff dwelling in the liminal beach zone recorded by archaeologists before inundation (Lenihan, et al. 1981b: 7-25).

Figure 13. An *Hisatsinom* cliff dwelling in the liminal beach zone recorded by archaeologists after inundation (Lenihan, et al. 1981b: 7-25).

Layman discusses the reaction of visitors to Ginko State Park where many of the petroglyphs from the canyon were 'relocated': 'Upon viewing them, numerous visitors are dismayed that this remarkable site has been inundated' (Layman 2002: 29). More research into how inundation preserves or compromises rock paintings and engravings would be beneficial.

Experimental Long-term Monitoring Projects

The NRIS was an important step in the understanding of freshwater submergence. Unfortunately, due to funding limitations, the experiments lasted at most 12 months, leading one to wonder how we can apply that data to sites which were flooded during the big dam era, back to the 1930s.

If long term monitoring programs had been implemented and continually monitored at the time of the report's publication, data would now be available on 20 year inundation effects. Project designs incorporating long term monitoring of submerged sites could improve our understanding of issues involving conservation and destruction of material remains. A research component of this sort may lead to important results as they have on land during the course of the last 40 years in the Overton Down Project (Jewell and Quimby 1966; Renfrew and Bahn 2001: 53) which 'created' an archaeological site and monitored its changes over time.

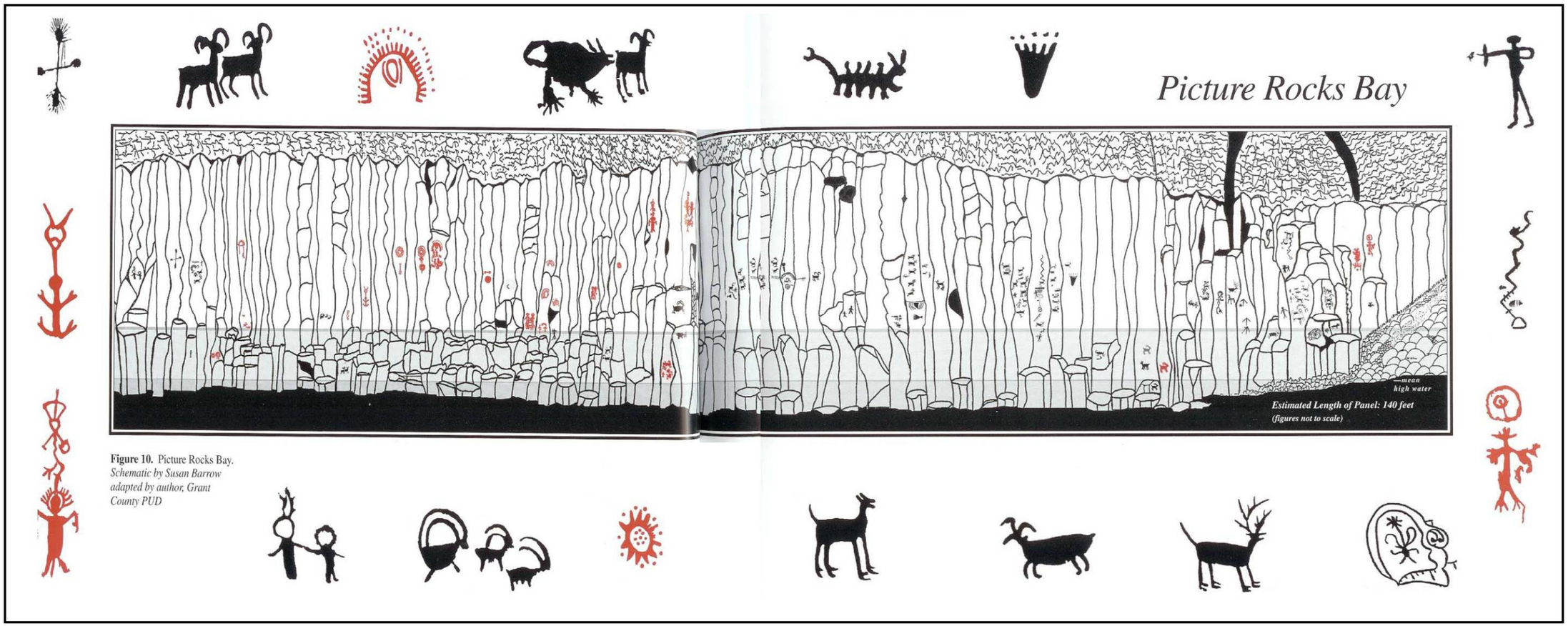


Figure 10. Picture Rocks Bay. *Schematic by Susan Barrow adapted by author, Grant County PUD*

Figure 14. Map of Pictured Rocks ay shows petroglyphs being eroded away in the destructive wave zone (figure adapted from Layman 2002).

These long-term projects would have been especially beneficial to understanding the effects of submergence on obsidian hydration dating, a technique now heavily used in archaeology to date cultural deposits (Ridings 1996), the NRIS indicated that such results could be heavily compromised by long-term inundation.

To increase the relevance of this data, long term monitoring projects are required within existing reservoirs. These experimental projects, in combination with proper management (Chapter 4), including site monitoring, will reveal the boundaries of preservation and destruction incurred on submerged resources in the Western United States. These results could then be used to mitigate damage on future projects worldwide. Even today, the construction of the Three Gorges Dam in China (Childs-Johnson, et al. 1996; Shen 2006) threatens thousands of archaeological sites with little thought for long term consequences.

The next section will turn away from the physical effects of inundation and scientific empiricism to look at the social impacts and heritage issues involved with removing access to cultural property and sacred places.

Chapter 4: Inundated Cultural Landscapes, Human Responses to Landscape Transformation and Reappropriation of Space

Inundated Cultural Landscapes & Submerged Archaeology

The recognition of intentionally submerged cultural landscapes as a specific type of landscape requires a broader understanding of the term. While dam construction has adversely affected a large number of archaeological sites in the past and present, it is recognized as only one part of a complex story of archaeological submergence. In recent years, archaeologists have accepted the idea of submerged landscapes in maritime contexts, even referring to seascapes in a broader cotext (Duncan 2005). While this term has been used to denote broad land patterns across the sea (McNiven and Feldman 2003) and underwater landscapes, the concept needs to be further extended to include submerged freshwater landscapes and intentionally inundated landscapes.

Landscape inundation can take many forms. The most common instances of submergence are due to global sea level fluctuations. For example, at the end of the Pleistocene the melting of the polar ice caps in some cases raised sea levels 60-100 meters (Masters and Flemming 1983). This in itself could have created more submerged occupation sites than all of the shipwrecks in the world's history. It has also been suggested by numerous scholars that key information to initial occupations of the 'New Worlds' may

in fact lie on now-submerged land bridges and coastal sites (Bowdler 1982; Faught 2004).

There have been many historical cases of naturally rising fresh or brackish water level inland, most of which remain undocumented. Some of the best researched examples of this type of inundation are the cenotes of Yucatan (Romey 2004) and small lake systems in Western Australia (Dortch, et al. 1990). In many of these cases, occupation sites which were at one time on the edge of a fresh water source are now many meters beneath the lakes and rivers humans once utilized.

Naturally diverging water sources, while being possibly the most destructive of these examples due to the fast currents and turbulent atmosphere of the water, remain possibly the most contested of these sites. There are many people who believe that proper management of these sites may include not intervening in their natural destruction (Johnson 2005) (see Figure 15). More specifically, they advocate letting the sites be naturally destroyed because it is part of the life cycle of their existence.

While many known historical cities, towns, and villages now lie underwater (Dixon 2005) it is well known that other, modern cites may soon also become part of our underwater heritage due to being built on unstable ground. The modern water-city of Venice, Italy is an ideal example. Sunken urban landscapes may well become havens for the sport divers of the future, and excellent case studies for the effects of inundation on present-day landscapes.

Figure 15. An Aboriginal Shell midden on Magnetic Island, Queensland being eroded by a perennial stream (photo by William Jeffery).

Finally, and maybe more meaningful to many of us today, cities fall victim to the wrath of nature and natural disasters. While some of these events may initiate a temporary inundation (BBC 2005; Gold, et al. 2005), others, like Port Royal, Jamaica, are much more permanent (Pawson and Buisserret 1975).

It should be obvious from these examples that underwater archaeology has never been a nascent subdiscipline; archaeology underwater has simply been a negligibly recognised archaeological context. Inundation has had great

effect on shaping who we are today and on what we individually and collectively perceive as our history. The landscapes that lie in our rivers, lakes, oceans, and reservoirs are distended with information – archaeological 'data' that could answer key question about our collective histories.

Of all these examples, dam construction is the only one which is intentionally initiated and therefore completely avoidable. For these reason, it is important that we do not allow these sites to slip out of our collective memory.

While it may seem obvious that these underwater landscapes still 'exist', the fact that periodic post-inundation monitoring of these sites is largely ignored exemplifies the need to articulate this unintentional dichotomy. This dichotomy exemplifies the need to suggest (or re-suggest) that these sites need to be monitored under federal law. The simple fact is that section 106 of the National Historic Preservation Act[5] requires the periodic monitoring of archaeological sites (King 1998: 59-61), and makes *no distinction* between submerged and non-submerged sites (Lenihan 1974b: 1). Under the letter of the law in the United States, agencies are failing to adhere to the National Historic Preservation Act guidelines by not actively monitoring culturally sensitive impounded areas.

[5] http://www.cr.nps.gov/hps/laws/NHPA1966.htm

A Landscape Approach – Are Underwater Landscapes Still Landscapes?

Landscape, as defined by Ingold (1993) is on ongoing story, rather than a collection of stories or a single record of the past. It has been pointed out that 'traditional thinking about landscape emphasizes binary distinction between the material/real construction of space and the imagined/mental construction of place' (Casey 1996). In order to 'see' landscape outside of current spatial and temporal frameworks, we recognize that space becomes place through personal memory and connection.

Illusory boundaries are one of the negative outcomes of this lack of separation between the 'real' and the 'perceived'; indeed this has been the primary difficulty with archaeologists discussing landscapes in the past. Ingold asserts that 'no feature of the landscape is, of itself, a boundary. It can only become a boundary, or the indicator of a boundary, in relation to the activities of the people (or animals) for whom it is recognized or experienced as such' (Ingold 1993: 156).

It must also be recognized that perceptions of landscape are multifarious. These can range from personal to national or international perspectives on what landscapes 'mean' or why they are important. Even within the same temporal frame, landscapes 'at any given moment… are multi-vocal' (Bender 1992: 735). Associations with landscape are not established primarily by cultural characteristics, but by personal affiliation. These perspectives are often appreciated by archaeologists, but not embraced due to the difficulty, especially in prehistory, of defining perspective. Bender

points out that it is sometimes 'hard for the archaeologist to understand how people might have conceptualized their relationship to the land' (Bender 1992: 744).

To an extent, elucidation of the landscape requires knowledge of archaeological cognition. In other words, the landscape cannot be interpreted properly without knowing the 'interpretive model' (Parker 2001) of the individuals who interacted with it in the past. In many cases, this information will be absent from the archaeological record. As a result, archaeology must be expanded to include discursive layering such as cognitive stratigraphy (Harrison 2004: 3). This causes a level of 'messiness' associated with postprocessual thinking that greatly complicates archaeological interpretation.

These concepts are particularly relevant to inundated landscapes which may only exist, for many people, in memory. This does not mean that these landscapes should be ignored. An acceptable landscape approach will draw from this memory and compare what remains inside reservoirs with what people remember was there. From a heritage perspective, one of the most interesting aspects of a landscape approach in reservoir archaeology may be reactions of individuals who experienced loss when they are confronted with the reality that these places are not 'lost'. Their thoughts and memories may likely be encapsulated within these structures. An even greater re-experience may arise in cases where dams are to be deconstructed, allowing memorial landscapes to re-emerge, albeit in a new form though as

will be discussed later, deconstruction travels with its own set of consequences.

Modern media, such as underwater videorecording, photography and live video feed (N.O.A.A. 2001: 5-44 to 45-49) can make submerged sites accessible to more than the experienced SCUBA diver or underwater archaeologist. Digital access to submerged landscapes can empower local communities, and allow them to re-experience cultural remains with a spatial dimension (Beale and Healy 1975: 892), a three-dimensionality that was not possible twenty years ago.

Dams as Multilayered Cultural Landscapes

The process of intentional inundation is a human transformation of landscape, not an erasure of place. It is an extreme example of colonialist archaeology (Trigger 1984) in which humans assume control of natural and cultural landscapes with deitic power. These transformations change the way we perceive landscape as well as the way we interact or experience the landscape (Thomas 2001). Phenomenological approaches in archaeology (Renfrew and Bahn 2001: 42; Tilley 1994) recognize that these transformations change not only the way we interact with these landscapes on a personal level, but also how we *interpret* these landscapes, and the cultural materials within them, as archaeologists. As our view of land changes, the way we view submerged cultural areas is changed by the fact that submergence allows us

to get a 360° birds-eye view of submerged cultural locals (Flatman 2003), rather than a traditional ground level perspective.

The material record itself is changed by inundation, adding greater complexity to the analysis of what is now a stratigraphically deflated, multilayered megacosm. What were once aboriginal rock quarries or seasonal hunting camps become the playground for decadent watersport recreation. What was once a spiritually significant ancestral burial becomes a highly charged political battleground for traditional rights and traditional cultural 'property' (Fish 2005b).

In these flooded landscapes, people lose a sense of what the Welsh call '*Y filltir sqwar*, the intimate landscape of one's childhood, the patch of ground we know in detail and will never know anywhere again' (Pearson and Shanks 2001). While the transformance of the cultural landscape has not destroyed these places, it removes ready, real-life access to them without the use of SCUBA equipment or the deconstruction of the dam. Never will those places be experienced in the same context by those who find them meaningful. Never can those places be interpreted in the same way by archaeologists attempting to reconstruct possible pasts.

Impoundment may open areas which where previously inaccessible to vandalism. In one case on Lake Seminole in Florida, archaeologist Nancy Marie White tells this story:

> The lodge-owner annually ran a boys' camp and took them to what he called the Underwater Indian Mound. At this highly significant site, which had been a large burial mound and village in the forks of the Flint and Chattahoochee

> Rivers, they would wade around and pick up complete 1500-year-old pottery vessels and other artifacts, as well as human skeletal remains [White 2000].

In many cases such as these, looting is not discouraged because archaeological survey has already taken place. But, the fact of the matter is that archaeological survey (the first phase of 'data recovery') 'will never find all the sites, not even all the big, important sites' (White 2000: 8) In some instances, landscapes that have been submerged are already thought to be damaged or destroyed, leading to greater instances of vandalism (or destructive research) at these sites.

Finally, the dam itself becomes a constituent of the cultural landscape after its construction. The dam is an important component of the archaeological record; a physical remanent of the legacy of modernity; a testament to the preference given to nationalistic prosperity over local community in the 19th Century North America.

Responses to Inundation – Reflections in the Archaeological Record

In an important case along the banks of the Upper Columbia River after the completion of the Grand Coulee Dam in 1941, Native Americans told stories and wept as a traditional fishing spot called Kettle Falls (See Figure 4.3) that was used for countless generations disappeared beneath the floodwaters (D.O.I. 1985).

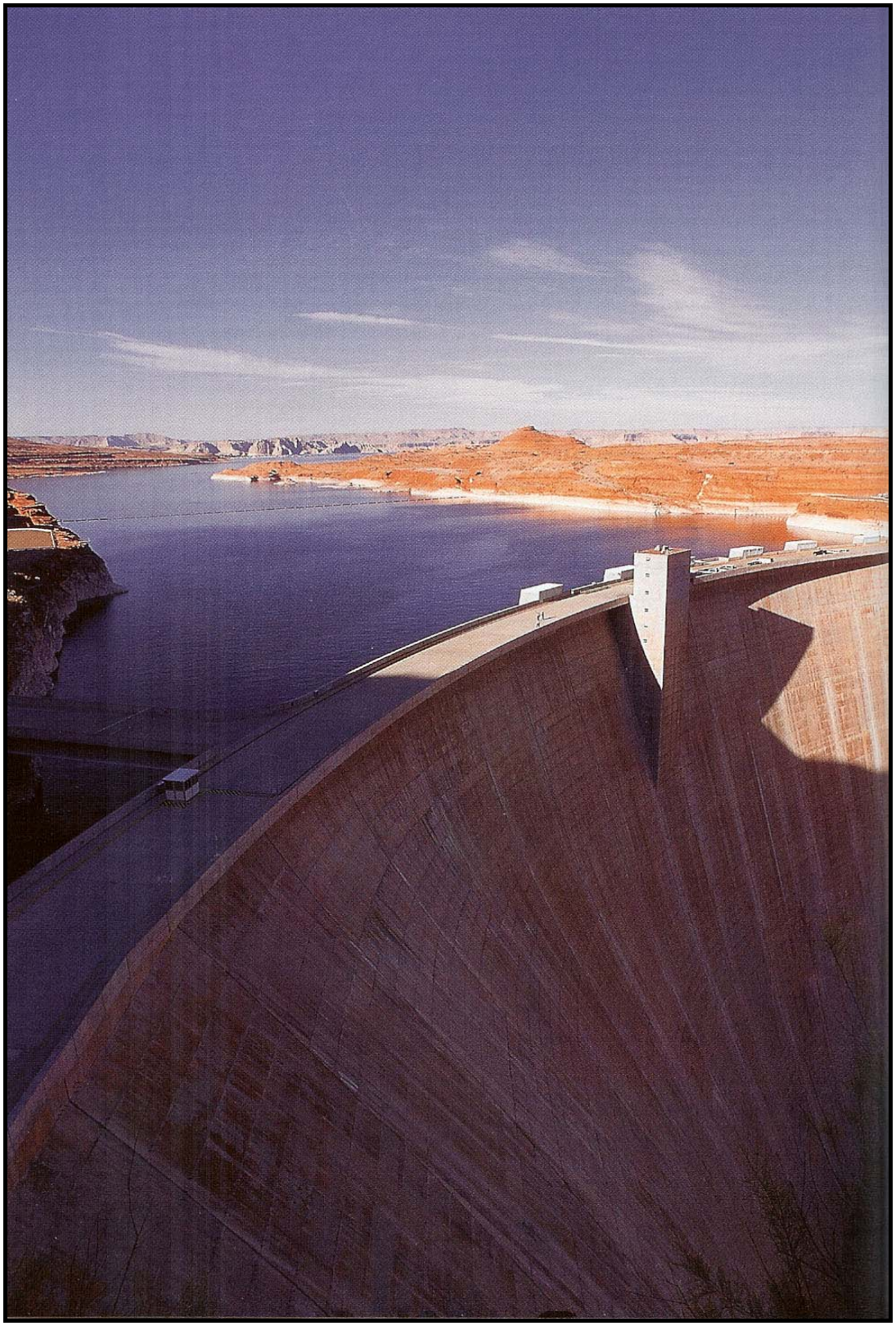


Figure 16. Shasta Dam, at the time of its construction, created the worlds largest man made lake (Lenihan and Brooks 1998: 226)

The dramatic impact of this event is captured by Howard Layman, a modern author who works on the Columbia. Layman points out that:

> Multiple losses were felt that week. It was a particularly sad time for those who had been forced to move their homes from the Grand Coulee Dam reservoir area. The people reflected and prayed – gone the salmon... gone thousands of acres of bottomlands and access to root and berry grounds.
>
> On July 15th, 1941, Kettle Falls disappeared. Its inspiring beauty – the foaming, surging, roaring, tumbling, mists, sprays, and shimmering rainbows in the sunlight – covered beneath the newly created reservoir [Layman 2002: 158-159].

In the case of Kettle Falls, the artefacts associated with a landscape rich with evidence of subsistence fishing that were carried downstream by powerful currents (see Figure 17) and turbulent waters now lie still in deep waters. After inundation, traditional fishing no longer took place at Kettle Falls. This potent example of the social impact of reservoir creation raises an interesting point. How are people's responses to impoundment reflected in the archaeological record?

Rather than attempt to quantify notions of response, it may be more beneficial to simply state that inundation of landscape is going to have a dramatic effect on the archaeological record under any circumstances. This may imply that modern waste will now dominate the landscape - as in a recreational reservoir like Lake Shasta. It may imply that the stratigraphic profile of these sites will now be stagnant - as is the case in protected, non-recreational reservoirs such as Hetch Hetchy in Yosemite National Park.

After a long period of inundation at Kettle Falls, a draw down on the Grand Coulee exposed dozens of sites around the area in the 1970s. As a response to this, archaeologists saw an opportunity to 'salvage' what they could of the emerging data. For years, David and Jennifer Chance excavated at Kettle Falls, pulling together the pieces of this 'lost' landscape (Chance and Chance 1977). Although archaeological research aims were different in the 1970s, this sort of response by the archaeological community to inundation may be troubling to individuals who lost their connection to land after submergence, and who may view archaeological recovery as an exploitation of their land and history. In some cases, actions undertaken by archaeologists who were attempting to practice 'good science' has dampened current relationships with communities.

The tradition of 'salvage archaeology' in reservoirs (Cole, et al. 1964; Smith and Weymouth 1952; Treganza 1954; Treganza 1958) has helped to deepen divisions between archaeologists and communities, and has worked to lump archaeologists with the bureaucrats, politicians and constructions crews who took away people's ability to access cultural areas. Salvage archaeology has been examined more recently by archaeologists who have observed that 'the traditional approach of 'salvaging' endangered resources by extensive excavation has been criticized, in part because excavation itself is a form of destructive impact' (Lenihan, et al. 1981b: 2-24). Obviously, reaction of the archaeological community to inundation also causes a great disturbance to the archaeological record, and should certainly be readdressed.

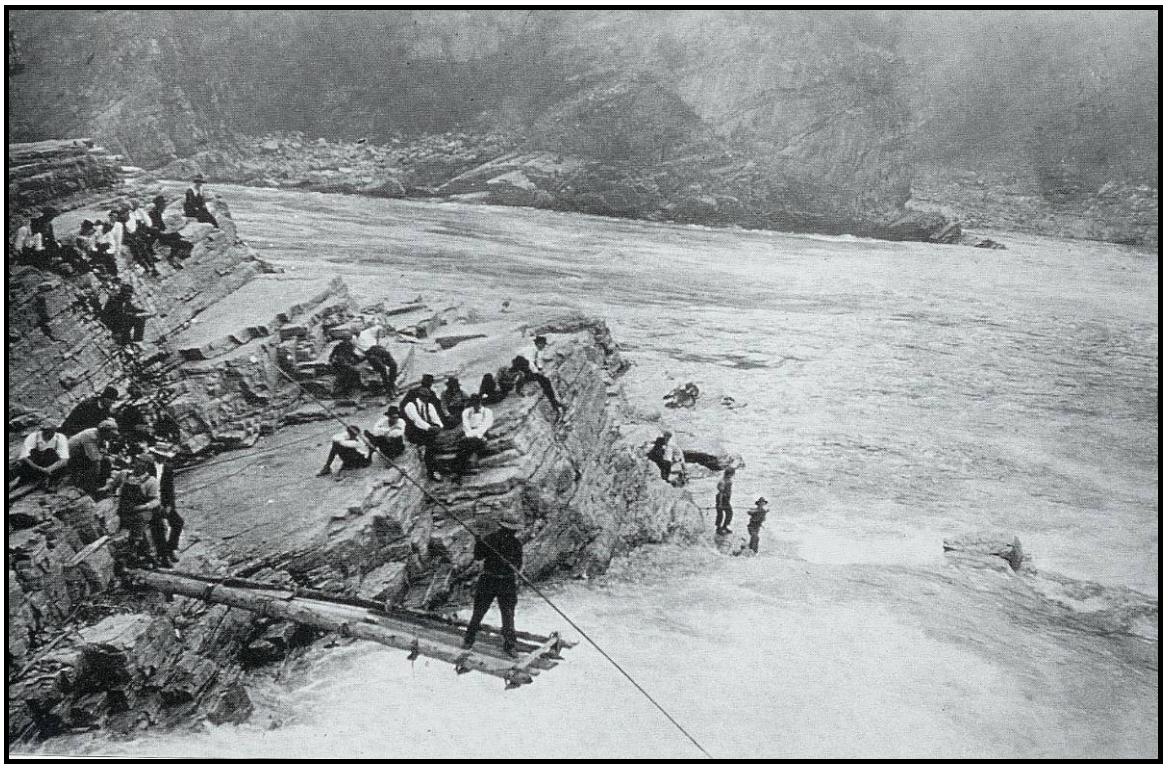


Figure 17**.** Kettle Falls on the Columbia River was a traditional fishing spot (Layman 2002: 157).

Figure 18. During the ceremony of tears, onlookers watched Kettle Falls disappeared under the new 'lake' (Layman 2002: 159).

Responses to inundation, particularly archaeologists' drive to recover 'data' before it is 'lost' and communities need to physically relocate drastically alter the archaeological record as artefact are relocated and removed. Analysis of what was left behind at the point of inundation may lead to interesting conclusions on the significance of certain cultural material.

Managing Public Resources – Reappropriation of Space or Destruction of Cultural Property?

Although many people may think that dams are constructed primarily for agriculture and power, the primary purpose of 35% of dams in the United States is as recreational areas (Lowry 2003: 32) (see Figure 19).

Primary Purposes of U.S. Dams

Purpose	*No. of Dams*	*Percent*
Fire and farm ponds	12,532	16.7
Flood control	10,971	14.6
Hydroelectric	2,259	3
Irrigation	7,223	9.6
Navigation	226	0.3
Recreation	26,817	35.7
Tailings and other	6,756	9
Water supply	7,293	9.7
Undetermined	1,110	1.5
Total	75,187	100

Figure 19. Primary purposes of dams in the United States (adapted from Lowry 2003: 32).

As previously noted, in 2001, Charmain O'Halloran wrote an honours thesis at Charles Sturt University in New South Wales on the effects of recreational activities on archaeological sites submerged in reservoirs (O'Halloran 2001). Out of this came two articles – one focusing on the archaeological impacts of recreational boating and fishing and one on wave action caused by boating (O'Halloran 2002; O'Halloran and Spennemann 2002). Both of these articles are groundbreaking, and are in no way confined to Lake Hume where the study was undertaken.

In the case of recreational boating and fishing, O'Halloran found that a significant amount of debris was being thrown from boats, causing stratigraphic complications in archaeological sites. In addition to this, well-meaning clean up crews were causing 'a gradual deflation of sites caused by the removal of the soil matrix and a lateral movement as well as the apparent loss of artefacts' (O'Halloran 2002: 2). O'Halloran suggests though that from a heritage context, this modern debris is itself cultural material which should probably not be removed, as it is a continuation of the cultural history of the area.

O'Halloran and Spennemann (2002) address wave action and site erosion. The authors points out that both recreational activities and draw-down of the dam have significant erosional impact on sites (O'Halloran and Spennemann 2002: 11). This is a good example of another sort of heritage issue that should have been taken into account during the dam construction

project proposal period. In Chapter 5 of the thesis, a discussion on the impacts of boating on Lake Shasta will further highlight this.

Heritage issues associated with recreational activities and their impact on cultural remains should be discussed. In many cases of landscape inundation, reuse of areas is not challenged. Newly created human-made lakes seem like ideal locations for housing tracts, boat ramps and fishing spots. The contamination and destruction that these activities cause are rarely debated outside of environmental concerns. While these sorts of activities might appear to be a continuation of the use-life of cultural landscapes, impacts to existing cultural resources, and the removal of living people with traditional claims to the land, must be addressed.

Chapter 5: Case Study: Shasta Dam and the Winnemem Wintu Tribe of Northern California

Great nations, like great men, keep their word
– United States Supreme Court Justice Hugo Black (1937-1971)

About 10 kilometres north of Redding California, a small 42 acre parcel of land is privately owned by the great niece and successor of the late great spiritual and tribal leader of the Winnemem Wintu, Florence Curl Jones (see Figure 20). This land should be held in trust because it is the site of Kerikmet Village, the only land that is held as contemporary 'property' by the Winnemem Wintu Tribe. The Winnemem Wintu also continue to utilize their traditional cultural properties, many of which are held by various private and federal government organizations including the United States Forest Service and the Bureau of Reclamation.

Figure 20. The late Winnemem Wintu spiritual leader Florence Curl Jones.

The Winnemem Wintu, despite having 125 surviving tribal members, do not hold promised reservation land. The United States federal government

refuses to recognize the Winnemem Wintu as a tribe today despite the fact that they have negotiated treaties with tribal leaders in the past. According to tribal leaders, the promise of recognition as a tribe has been used as a bargaining chip by the government to keep the Winnemem from voices concerns about government policy (Sisk-Franco 2005).

Many battles have been fought by the Wintu to retain their traditional lands, including a fight against the construction of the Shasta dam in Redding California in 1938 which ended in the submergence of a number of cultural areas sacred to the Winnemem. The Winnemem Wintu are victims of a legacy of modernity, the inheritors of a history submerged by California's insatiable thirst and growing population. The plight of the Wintu is a difficult story to tell, but is an important component of industrial cultural legacies, and a poignant reminder of why this topic remains one of the most pertinent today.

The Winnemem People

Traditional Wintu society was broken up into nine different bands which in total numbered over 20,000 people by at the time of contact, 1848 (Fullwood 2002). Today, less than 2000 people claim Wintu ancestry. Of these, the Winnemem Wintu have 125 active tribal members. The Winnemem Wintu territory was the most northern of these nine groups, based on the McCloud River watershed in what is now Northern California, and stretched from Bear Mountain in the south to Mount Shasta in the north. The word Winnemem means middle-water, referring to the McCloud which runs between the

Sacramento and Pitt Rivers (Figure 21). The Winnemem Wintu have lived on this river for over 1000 years, utilising the area for living, subsistence, and ritual (Cummings 2004).

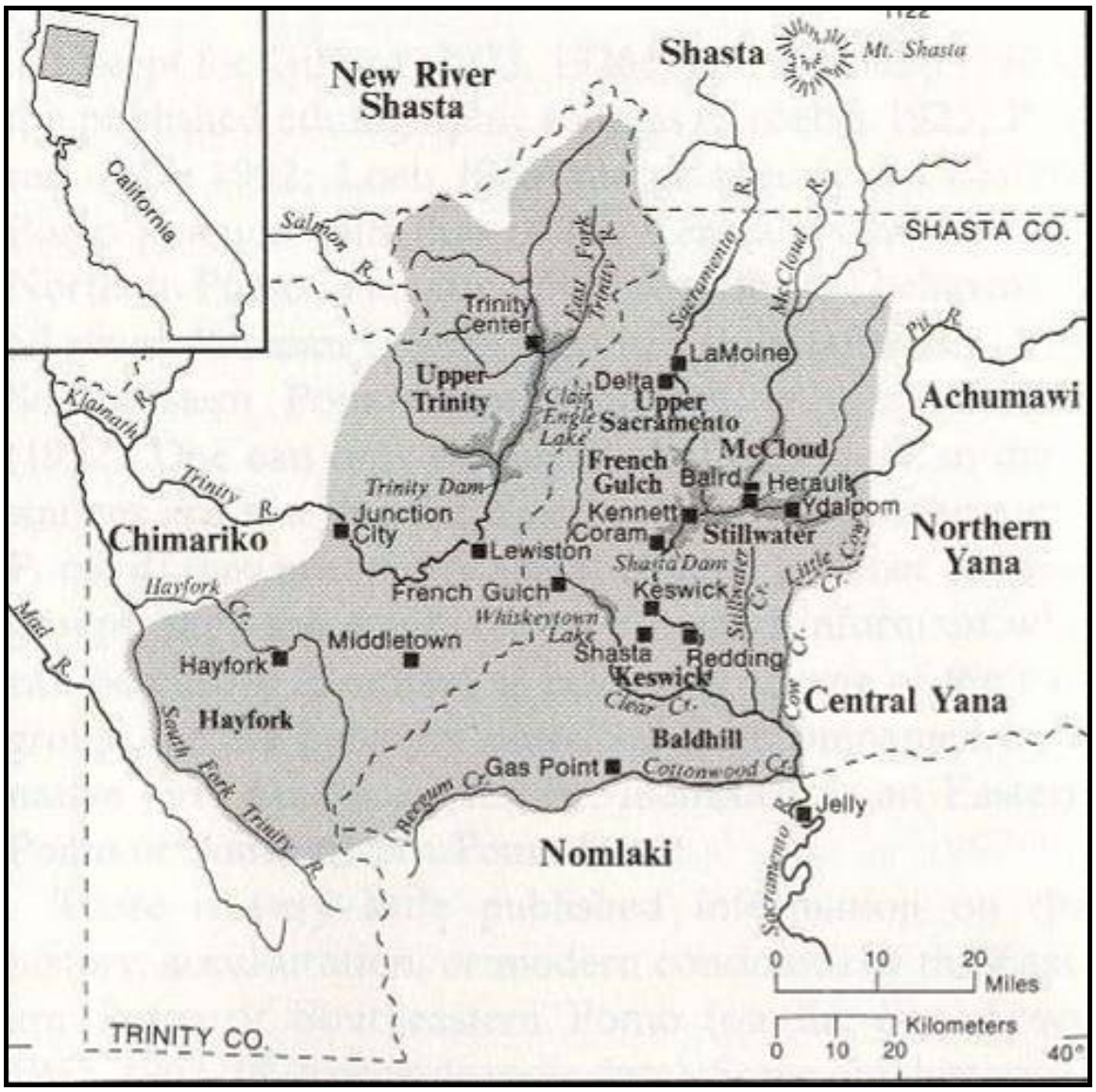


Figure 21. Traditional Wintu territory (Figure adapted from Smith and Weymouth 1952).

The Wintu have fought to retain their culture since the genocidal California gold rush era of the mid-1800s. Indian extermination policies were encouraged by the United States Government, who paid out over $924,259 between 1850 and 1859 for the mercenary killing of Indian people (Norton 1979: 76). Due to murder and disease, the population of Winnemem Wintu

dropped from 14,000 people in the 1850s to an estimated 395 by the 1930s (Franco and Sisk-Franco 2002: 4). Due to this population atrophy, the Winnemem Wintu have never been formally recognized as a Native American Tribe by the United States Government. Despite this, the federal government included the Winnemem Wintu under the Dawes Act of 1887 (Forbes 1969: 90) and has negotiated with the tribe as a group on a number of occasions, and irony recognized by tribal leaders.

In 1851, the Winnemem Wintu signed a treaty with the US Government at Readings Ranch in California ceding all of their remaining lands in exchange for a 25 square mile reservation. No reservation was ever established, but the lands were taken from the Winnemem regardless. After years of battle, the Winnemem were given land allotments along the McCloud River, on a small fraction of their traditional territory. This small victory was to be short-lived as the Indian Land Acquisition Act was signed into law in 1941, which states that tribal lands would be confiscated in return for fair compensation in order to initiate development of the world's largest reservoir in the heart of traditional Winnemem land (Figure 22).

History Submerged

In 1938, construction of the Shasta Dam and the state's largest man-made lake began at the confluence of the Pit, McCloud, and Sacramento Rivers. This construction submerged hundred of cultural sites, including an entire mining town called Kennett (Figure 24).

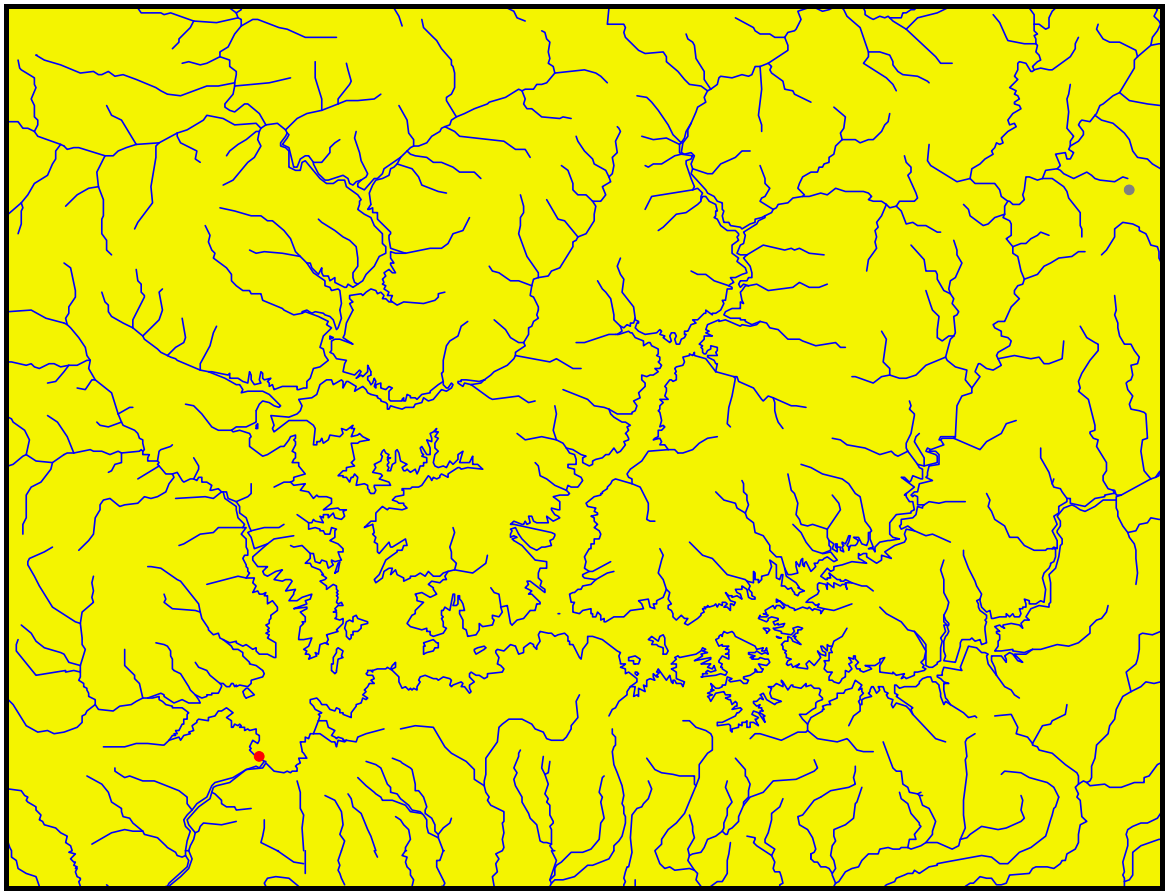


Figure 22. U.S. Army Corps of Engineers map of Lake Shasta. The Shasta dam is in red. Notice the backup along the McCloud, Pit, Squaw Creek, and Sacramento Rivers (Image obtained from the United States Army Corps of Engineers National Inventory of Dams database). [6]

Traditional Winnemem territory lies north of the proposed dam, in an area which early ethnographers described as 'particularly favorable to aboriginal habitation' (Bois 1935: 6). Recognizing this threat to their traditional land, the Winnemem were forced to relocate to privately bought land near Redding, California, a small village now called Kerikmet (Franco and Sisk-Franco 2002).

Since the Winnemem were not recognized by the federal government as a sovereign tribal entity, no relocation funds were allocated to them. In 1942, Winnemem delegates travelled to Washington DC to fight for the

[6] http://crunch.tec.army.mil/nid/webpages/nid.cfm

passage of SB1112, which allowed the tribe to sue the federal government for rights abuses. Due to this pressure, the United States Shasta Reservoir Indian Cemetery Act was enacted to relocate burials subject to flooding. While this act was also supposed to provide land for living Winnemem people, their requests were denied because they 'were not Shasta Reservoir Indians' (Sisk-Franco 2005), a name concocted by the federal government.

Archaeological survey was then undertaken by C.E. Smith and W.D. Weymouth (1952), archaeologists from the University of California Berkeley. Archaeological survey maps of the area prior to site inundation show that at least 37 sites of 'archaeological significance' are impounded under the floodwaters of Lake Shasta (Figure 23), including 183 human burials. This report, while beneficial, failed to record pertinent ethnographic information regarding site locations and significance. As Caleen Sisk-Franco, spiritual leader of the Winnemem points out:

> I am not quite sure what they mean by 'archaeological' sites. We have sites that probably an archaeologist would stumble right on past because it doesn't have mortar holes, it doesn't have hand tools, it doesn't have a lithic scatter. It may just be a big rock. There were several of these sites which were fishing places, salmon fishing places which were submerged [Sisk-Franco 2005].[7]

It is likely of course that many more than 37 culturally significant sites were submerged, though others may not have had particularly significant 'archaeological' values. Smith and Weymouth (1952) concluded that '…almost

[7] Interview transcripts is located at www.archaeologyunderwater.com/research

the entire habitable terrain once occupied by [the] Wintu tribe has been inundated' (Smith and Weymouth 1952: 2).

Much of the Winnemem's history was submerged by the fluid path of progress just after World War II, severely altering tribal ties to landscape and tribal identity. According to Caleen, the Forest Service continues to tell the Winnemem that they can practice their ceremonies without these places (Sisk-Franco 2005). Caleen's response is that 'these sites are the heart of the tribe' and that they cannot practice without them. The spiritual leader goes on to talk about two important sites: puberty rock and sacred pools at the foot of the Two Sister Mountain, both areas necessary for coming of age ceremonies. Caleen says that:

> …even just destroying those two sites is like saying that I think the pope can do without his cross and chalice. We will just flood those things. You can still have your traditions, you just can't have those things [Sisk-Franco 2005].

Following the inundation of the majority of their traditional cultural property, the Winnemem quietly continued to fight for their rights, constantly defending their remaining lands from government control and development, including a ski lodge proposed by the United States Forest Service on the Winnemem's most sacred place, Mount Shasta (McLeod 2001).

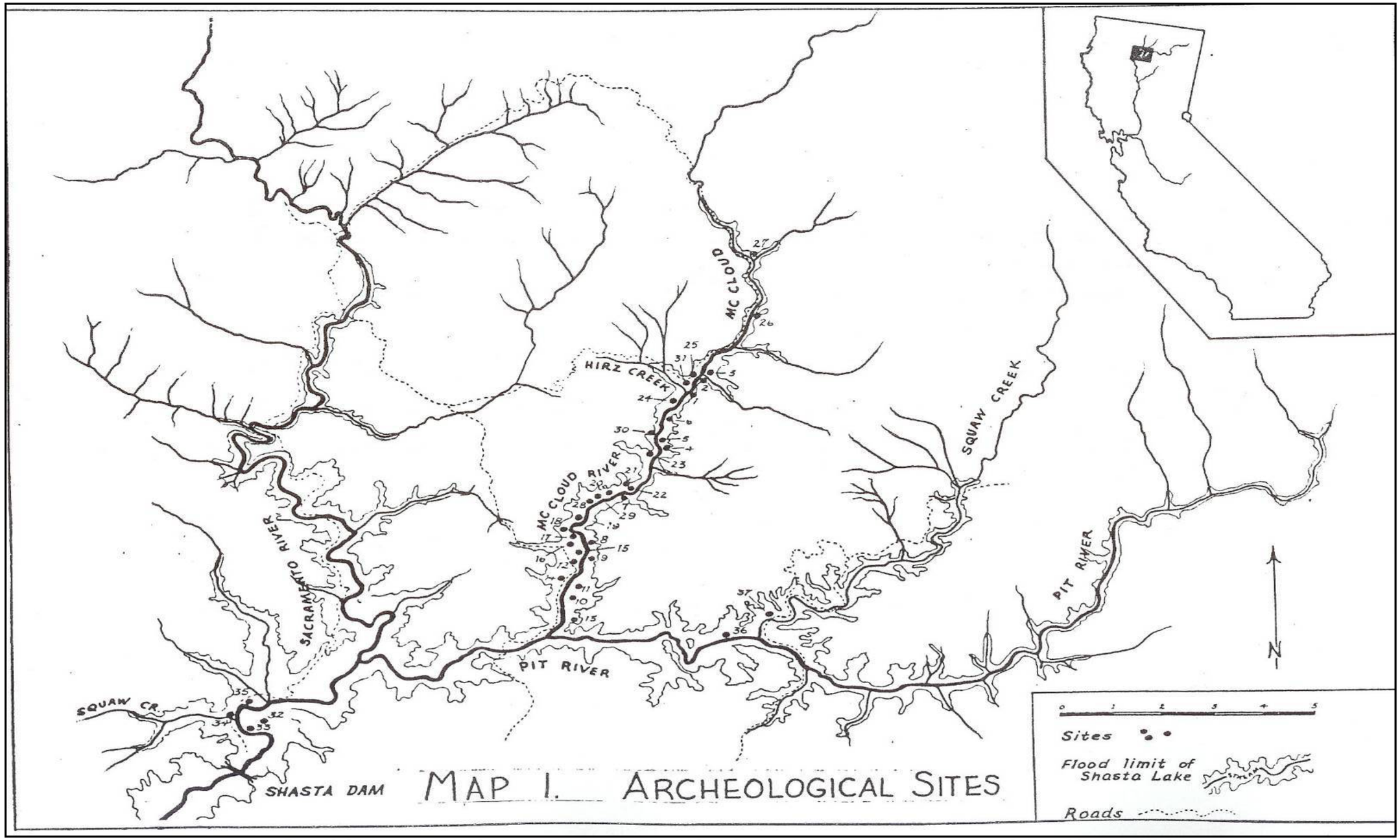


Figure 23. Original archaeological Survey map prior to the construction of Shasta Dam showing proposed floor areas (adapted from Smith and Weymouth 1952: 3)

Figure 24. The mining town of Kennett California, which once boasted a 3000 person population, was completely submerged beneath Lake Shasta (photo obtained from http://clui.org/clui_4_1/ondisplay/submerged).

The War Dance of 2004

After years of battles with the federal government, early in 2001 the Winnemem were advised by a fellow Native American tribe that the United States Bureau of Reclamation was holding meetings to discuss raising the Shasta Dam another 6 ½ to 200 feet, yet again to quench the thirst of arid California farmlands. Though the meeting was proposed as an open public discussion, the Winnemem were not invited or even advised that it was taking place despite the fact that the raising of the dam would submerge another '20 sacred sites, including a burial ground of 17 additional Winnemem and a rock where Winnemem girls pray as part of a puberty ritual' (Murphy 2004) and a site where 42 Native peoples were massacred 150

years ago (Ritscher 2004). The Winnemem however did make it to the meeting, voiced their concern, and were quickly dismissed, with the government telling them that the tribe would have their time to object in the final stages. Caleen responded by stating 'wouldn't you want to save the taxpayers a lot of money by identifying that these cultural sites and traditional properties of an active tribe up front?' (Sisk-Franco 2005).

The impact overview drafted by the Bureau of Reclamation in August of 2004 for the proposed level increase does not even discuss cultural impacts of the construction. Caleen suspects that the NEPA (National Environmental Protection Act) and Section 106 process will not take place until the cement is being poured. Once again, injustices are being perpetrated against a peaceful people because of the failure of the federal government to recognize the Winnemem as a sovereign nation of Native Americans.

As a result, the Winnemem are willing to go to extreme measures to preserve their heritage. As University of New Mexico anthropologist Les Feld pointed out:: 'When those places get threatened or occupied or expropriated or somehow taken from them, that calls for preparation for conflict' (cited in Melley 2004).

As a response to the government's plan, the Winnemem, led by the tribal head man, Mark Franco, conducted a ritual war dance, a *Hu'p Chonas*, against the dam. The last time this dance was conducted was in 1887, when the Winnemem danced against a fishery built along the McCloud River. A year after the last war dance, the fishery was swept away by a flood.

Figure 25. Winnemem War Dancer prepare for four days of public protest (photo by Michael Burke, Associated Press).[8]

The dance is a performance of protest by the Winnemem, a call to the world to come to their aid against the continued loss of Winnemem sacred sites (Figure 26). Spiritual leader of the Wintu, Caleen Sisk-Franco, states that:

> The war dance itself is a message, a message to the world that we can't stand to put up with this again. We've already lost too many sacred sites to the lake. To lose more is like cutting the legs off all the tribal members [Ritscher 2004].

Many of the remaining members of the Winnemem Wintu are afraid that the inundation of these 17 sites will immeasurably disrupt the tribe's cultural connections to landscape and irreparably alter their ability to conduct

[8] http://msnbc.msn.com/id/5998754

traditional ceremonies (Murphy 2004). Mr. Mulcahy, a Winnemem elder stated on the day of the war dance that 'if [these sites] go under the water, it will be like somebody just came in and bulldozed the church down' (Murphy 2004).

The war dance conducted by the Winnemem (Figure 27), led by Caleen Sisk-Franco and Mark Franco, lasted for four days, filled with dance, ritual, and fasting conducted around an ever burning flame.

Only time will tell if the dance was successful in stopping the proposal; only time will tell if the Winnemem have defeated their 602 foot enemy.

The New Old Tradition – Winnemem Puberty Ceremonies

In July of 2006, the Winnmem Wintu held a puberty ceremony that have not been observed for 80 years. The construction of Shasta Lake submerged a sacred rock used for puberty ceremonies in the 1930's - instantly severing a long-held cultural tradition (Ross 2006a).

In an effort to re-establish the tradition, the Winnemem returned to the sacred space of the ceremony, now a public campground run by the United States forest Service. The Forest Service denied the Winnmem's request to close the branch of the river being used for the rights, but initiated a voluntary closure during the week-long ceremony.

The cermenoy was being held for Marine Sisk-Franco, daughter of the Head Man and Spiritual Leader of the Winnemem Wintu. The ritual was interrupted by boaters who, according to reporter Kimberly Ross of the Redding Record Searchlight "yelled obsenties and made mocking gestures at

the group… a women in a bikini raised her beer can and exposed herself, all just before the high point in Marine's initiation' (Ross 2006a).

Despite this, the Winnmem continue to modify their cultural traditions to maintain their connection to the earth and the past. For instance, the tradition of grinding herbs into puberty rock by the initiate had to be moved because the original rock is underwater.

Caleen Sisk-Franco argues that the federal government has failed to respect the Tribe's religious rights. Caleen was quotes as stating that it was '…ironic that it's the Fourth of July, 2006, and we're still begging around for our rights. We're still not there yet' (Sisk Franco quoted in Ross 2006b).

Futures of the Winnemem

The Winnemem Wintu can never be compensated for their lost spiritual places. The damage done by the federal government and new continental settlers over the course of 150 years cannot be forgotten or repaired. But these issues are far from antiquarian remnants of the past. The current actions by the United States Bureau of Reclamation serve to remind us today that the battle for indigenous rights is far from over. In fact, in the case of the Winnemem, it could be argued that it never began.

Dozens of Winnemem elders still lie in watery graves under Lake Shasta, subjected to not only the erosional processes of the water, but to the deposition of modern cultural material onto sacred sites. Some Winnemem elders feel that repatriation of these remains should still occur. Others would like to see what has happened to their submerged cultural heritage.

Figure 26. Caleen Sisk-Franco leads dancers in protest of the Shasta dam expansion (photo by Michael Burke, Associated Press).

Figure 27. A Winnemem dancer at the ceremony (photo by Michael Burke, Associated Press).

It is possible to continue repatriation of cultural material and to conduct archaeological investigation despite the fact that these sites have been submerged. It is also feasible to conduct monitoring in these areas, taking digital underwater video and photographs which can be shared with the Winnemem, possibly allowing a revival of cultural tradition as these 'lost' places can once again be viewed and explored with three dimensional digital media.

The United States Bureau of Reclamation has a federal obligation to continue actively monitoring these sites, as well as a federal obligation under Section 106 of the National Historic Preservation Act to mitigate impacts to important cultural areas. This act makes no exception for sites, regardless of location. Underwater monitoring is inexpensive, feasible and completely necessary to satisfy federal cultural resource protection legislation. This data on the current status of submerged Winnemem sites, which has never been collected, is also integral in the decision making process in the proposal to raise the dam and submerge more sites. How can mitigation procedures be discussed or even hypothesised without knowing what the final impact will be? How can the Bureau of Reclamation make a decision on which sites are important enough not to flood without ever talking to the people who own and use those places both today and in the past? The Winnemem would look favourably on these ideas, and would insist that the raising of the dam be put off until these studies can take place.

Caleen knows that the sites that are already submerged are being damaged. Not only is erosion taking places on the bank of the lake, but recreational activity is taking a heavy toll. Caleen observes that 'when the water recedes, you can see the oil residue on the banks' (Sisk-Franco 2005).

The Winnemem are working hard to integrate their cultural traditions into a new society. When asked what she would like to see happen, Caleen simply states that

> I would like to see the government deal with the Winnemem Wintu fairly and justly. Give us our like land to live on, promised under the 1937 Act of Congress. These camp sites and boat ramps out there on the lake could have been our like land to live on [Sisk-Franco 2005].

When asked about the possible deconstruction on the dam in the future, Caleen was hopeful, but concerned about how the Forest Service would protect their sacred sites. She pointed out that last summer, during a fifty percent drawdown at the dam, people in 'houseboats were out there digging around' (Sisk-Franco 2005).

The Winnemem have fought a long battle for recognition, a battle which is far from over. The submergence of Winnemem sites along the McCloud has severely altered their tribal identity, as it has in many other cases of archaeological submergence. Voices cry out from these reservoirs, asking for recognition of the fact that their people have suffered.

In closing, Caleen spoke about those sites which are now submerged and those which will be:

> We already did this one time and I think that our people have suffered for that. The traditions of the Winnemem

people go right back to the losses incurred by losing our territory. Everything we ever knew is underwater [Sisk-Franco 2005].

Figure 28. Houseboat docks and boats ramps now sit on territory promised to the Wintu under a 1937 Act of Congress. Sacred sites also now lie below the shoreline (photo by author).

Conclusion: Mitigating the Mistakes of Modernity

> The postmodern reply to the modern consists of recognizing that the past, since it cannot really be destroyed, because its destruction leads to silence, must be revisited: but with irony, not innocently [Echo 1994: 67-68].

This thesis has raised a number of critical, complex questions. While solutions to these can be offered on a very broad level, as always, cultural landscapes and areas must be analysed on an individual basis. As archaeologists, we must also accept the fact that many questions will never be answered. Obviously, this topic cannot be thoroughly explored in the course of a short thesis, and the examples chosen for this discission may not be characteristic of most reservoirs. These examples are, however, excellent case studies within the topic that could be expanded for future research.

The goal of this thesis was to articulate the importance of the archaeological landscapes that exists behind dams and in reservoirs in the Western United States, and to highlight the need to recognize these cultural legacies prior to development. It is clear that we are making progress in this area, as some archaeological survey projects are now ending in decisions not to construct dams based on cultural surveys (Smith 2000). Still other projects from the big dam era are now subject to reemphasis with possibilities of deconstruction and cultural reconciliation (Gardner 2005).[9] While the state of awareness generally may be increasing, situations such a those of the Winnemem Wintu tribe continue to trouble. It would seem that the 'big dam

[9]For more information on the possibility of draining Hetch Hetchy, go to http://actionnetwork.org/campaign/hetch_hetchy1/i5ug7b4a565657

era' is has not yet ended as some have suggested (McCully 2001), but that the tactics have simply changed. Rather than looking forward to the 'end' of the big dam era, anthropologists may work to transmute cultural damming into a recrudescence of artefact and landscape with an eye toward revisitation and deconstruction. Of course, deconstruction may carry with it an entirely new set of consequences. Taking down these cement monsters may destroy town dependant on the new lake such as Page, Arizona near the Glen Canyon Dam (Lowry 2003: 97). Control of looting in these new areas may also be a problem as drowned sites emerge. With hopes for a positive future, we must never forget our past. Embracing this part of our cultural history is important, as these legacies will be reflected in personal histories and stratigraphic profiles for years to come.

Already, with books like *Damming the Past* (Brandt and Hassan 2006), and a multiplicity of weekly newspaper articles discussing the possible impact of draining Hetch Hetchy (Gardner 2005; Lowry 2003: 39), draw downs at Lake Powell provoking public looting of *Hisatsinom* sites (Dortch, et al. 1990), and the effects of destruction of Salmon Runs on the Columbia on Native peoples[10], dams are once again a contemporary topic. Even a museum exhibit by the Center for Lands Use and Interpretation in Los Angeles explored submerged landscapes (see Figure 29), pointing out that 'their remnants persist, preserved underwater, and sometimes emerge, as reminders of what was not allowed to be' (CLUI 2005).

[10] See http://www.nationalgeographic.com/earthpulse/columbia/index_flash.html

These silenced voices are best brought out by anthropologists, archaeologists, and historians using digital technologies to enhance the voice of the living and lend voice to the dead. The ability to explore futures that never were is a rare one that we should feel obliged to take up.

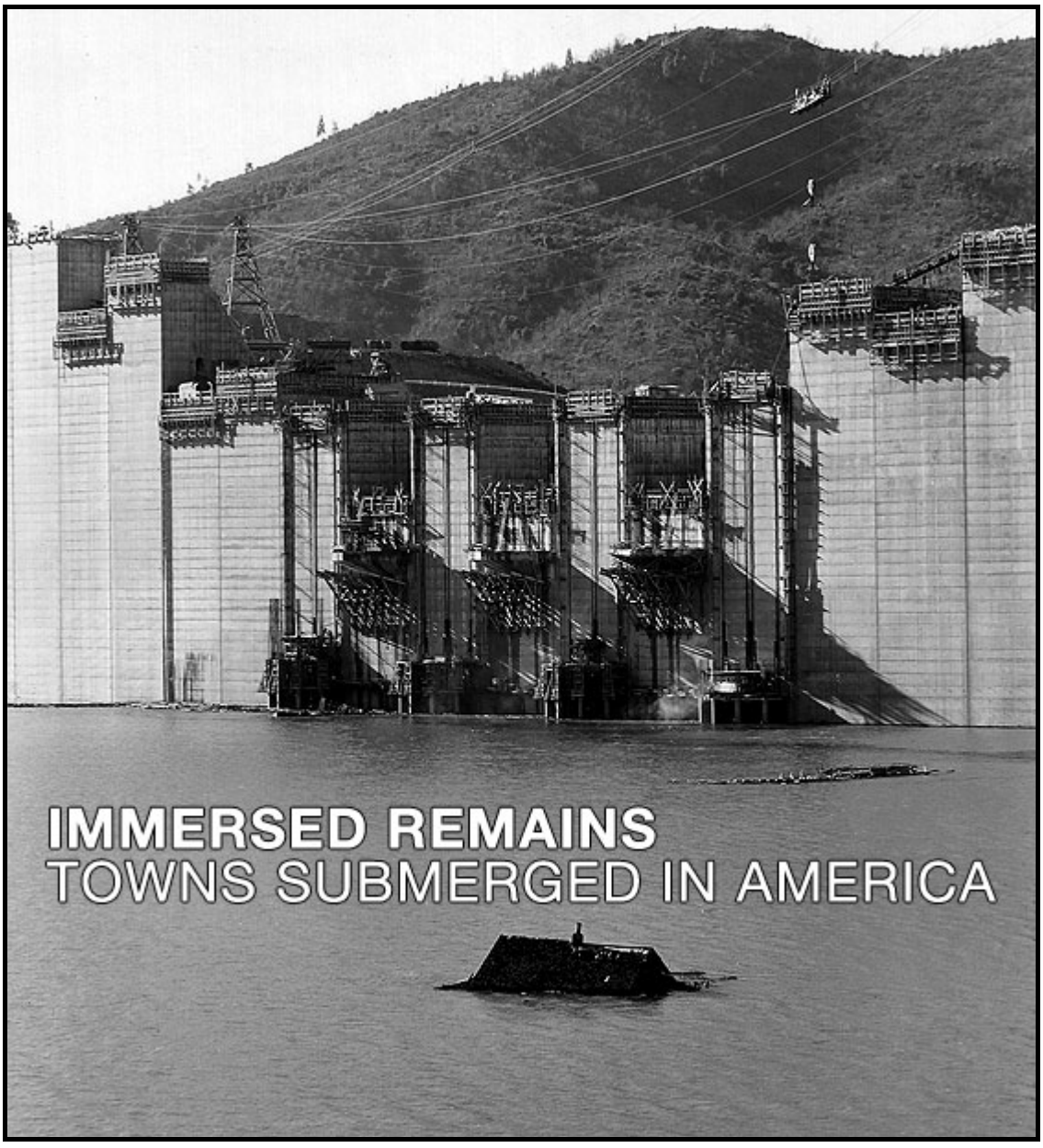


Figure 29. A new exhibit at the Center for Land Use and Interpretation discussed drowned landscapes (Photo obtained from http://www.clui.org/clui_4_1/ondisplay/submerged/index.html)

This research also discussed past research in the area, physical and social impacts of inundation, management procedures, legislation, and emphasized the need for high-tech digital indigenous archaeological procedure.

While these issues were narrowed down for the purpose of the thesis, their implications may extend far beyond. Many years could be spent collecting the memories and histories of the dig dam era. Many new doors of possibility, due to embracement of multifarious interpretation and purveyance of digital technologies, have been highlighted in the course of this exploration (Fish 2005a). It is the hope of the author that this research may rekindle interest in the topic and encourage future research on intentionally inundated sites.

Digital Underwater Conciliation - Possibilities of Thought and Technology in Underwater Archaeology

This thesis has clearly shown that even in this hyper-digital, politically conservative postmodern thoughtscape that is our existence, human abuses, like what is being enacted in the form of a land-grab against the Winnemem Wintu, are still be perpetrated in the United States Government. It the responsibility of anthropologists is to mitigate the possible damage these actions could cause and to act as mediators between cultural 'resource' stakeholders. In the case of archaeological and spiritual landscape impoundment, archaeologists confortable working underwater are the most qualified individuals to undertake this work.

New technologies in underwater breathing systems, underwater video, excavation and site location equipment mean that we no longer have to depend on 'salvage archaeology' as the only viable mitigation option. Post-inundation site monitoring can and should take place (Rayl, et al. 1978: 106). This is the first step in new management solutions.

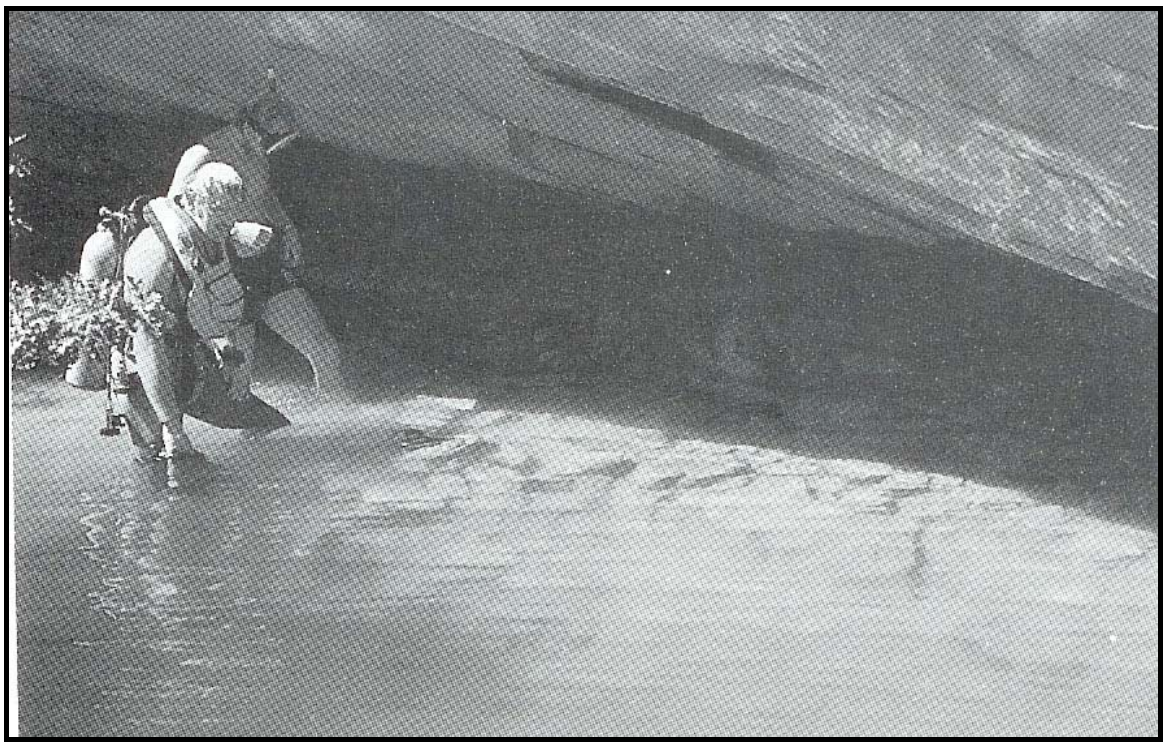


Figure 30. Underwater archaeologists from SCRU at Lake Powell surveying shoreline erosional damage to *Hisatsinom* structures (Lenihan, et al. 1981b: 7-38).

Toward a Solution - The Future of Drowned Landscapes

As time moves on, and as technological augmentations expand; we may find that dams have become a stale memory of a modernist hydraulic utopianism that never came to be. As these liquid barriers come down, due to mechanical failure or human protest, these emerging 'forgotten' landscapes will offer us a unique possibility to study the the cultural comprimses made in

the modern period for access to resources. Perhaps even the dams will continue their use-lives, becoming newly appropriated space, havens for base jumpers, destinations in wilderness hikes, or pilgrimage sites for new generations of students eager to learn about our hydroelectric past.

The most important solution that we can implement right now is recognition of obligation on both legislative and ethical grounds for continued monitoring of these places and recognition for the need to propagate the flow of discussion regarding the thousands of sites that have already been submerged.

Plights such as those of the Winnemem Wintu remind us this this topic is relevant, timely and important. With the effects of dam construction of cultural sites documented, we can now make more informed decisions regarding .

Sources Cited:

Adovasio, J. M., J. Donahue, W. C. Johnson, J. P. Marwitt, R. C. Carlisle, J. D. Applegarth, P. T. Fitzgibbons and J. D. Yedlowski
1980. An inundation study of three sites in the Bluestone Reservoir, Summers County, West Virginia. In *The final report of the national reservoir inundation study volume II*, edited by D. J. Lenihan.

Anderson, D. G., B. C. Keel, J. H. Jameson, J. F. Cobb and J. W. Joseph
2006. Reservoir construction in the Southeastern United States" the Richard B. Russell project as an example of exemplary heritage/resource management. In *Damming the past: cultural heritage management and dams in global perspective* Lexington Books, Lanham.

Anonymous
2006. Cruising America's Waterways. Lake Powell: Glen Canyon on the Colorado River. http://members.aol.com/americacruising/lakepowell.html. Accessed 19th June 2005.

Anyon, R., T. J. Ferguson, L. Jackson and L. Lane
1996. Native American oral traditions and archaeology. *Society for American Archaeology Bulletin* 14(2):14-16.

Aplin, G.
2002. *Heritage: identification, conservation and management*. Oxford University Press, Oxford.

BBC
2005. Tsunami remembered six months on. In *BBC News: UK Edition*.

Beale, T. W. and P. F. Healy
1975. Archaeological films: the past as the present. *American Anthropologist* (77):889-897.

Bender, B.
1992. Theorising landscapes, and the prehistoric landscapes of Stonehenge. *Man* 27(4):735-755.

B.L.M.
1997. 8100 - Cultural Resource Management, Interim Guidance. On file at the United States Bureau of Land Management.

Bois, C. D.
1935. *Wintu Ethnography*. University of California Press, Berkeley, California.

Bowdler, S.
1982. Coastal archaeology in Eastern Australia: proceedings of the 1980 Valla conference on Australian prehistory.

Brandt, S. A. and F. A. Hassan
2006. *Damming the past*. Lexington Books, Maryland.

Canclini, N. G.
1993. *Transforming modernity: popular culture in Mexico*. The University of Texas Press, Austin.

Carrell, T., S. Rayl and D. Lenihan
1976. *The effects of freshwater inundation of archaeological sites through reservoir construction : a literature search*. On file at the United States Department of the Interior, National Park Service, Cultural Resources Management Division, Archaeology, Washington.

Casey, E. S.
1996. How to get from space to place in a fairly short amount of time: phenomenological prolegomena. In *Senses of Place*, edited by S. Feld and K. Basso, pp. 13-51. School of American Research.

Chance, D. H. and J. V. Chance
1977. *Salvage archaeology in and beside Lake Roosevelt*. Laboratory of Anthropology, University of Idaho, Moscow, Idaho.

Childs-Johnson, E., J. L. Cohen and L. R. Sullivan
1996. Race against time. In *Archaeology Magazine*. vol. 49.

CLUI
2005. Immersed Remains Exhibit. Center for Land Use Interpretation, Los Angeles.

Cockrell, W. A. and L. E. Murphy
1978. Pleistocene man in Florida. *Archaeology of Eastern North America* 6(Summer):1-13.

Cole, D. L., L. R. Kittleman and F. C. Leonhardy
1964. *Interim report 1963-1964 John Day Dam Reservoir project*. University of Oregon.

Cummings, C. H.
2004. The Winnemem Wintu: Waging war on Shasta Dam. *Earth First! Journal (November-December 2004)*.

D.O.I., U. S.
1985. Kettle Falls interpretation pamphlet. National Park Service. United States Government Printing Office. Washington D.C.

Debord, G.-E.
1995. *The society of the spectacle*. Zone Books, Cambridge, Massachusetts.

Delgado, J. P.
2001. *Encyclopaedia of underwater and maritime archaeology*. British Museum, London.

Dening, G.
1996. Voices from the beach. In *Exchanges; cross-cultural encounters in Australia and the Pacific*, edited by R. Gibson. Historic House Trust of New South Wales, Sydney.

Dixon, N.
2005. *The crannogs of Scotland: an underwater archaeology*. Tempus Publishing, Edinburgh.

Dortch, C., G. Henderson and S. May
1990. Prehistoric human occupation sites submerged in Lake Jasper, Southwestern Australia. *The Bulletin for the Australian Institute for Maritime Archaeology* 14(1):43-52.

Duncan, B.
2005. *The maritime cultural landscape of Queenscliff and Southern Port Phillip Bay*. Unpublished doctoral dissertation, James Cook University.

Echo, U.
1994. *Reflections on the name of the rose*. Minerva, London, United Kingdom.

Faught, M.
2004. The underwater archaeology of paleolandscapes, Apalachee Bay, Florida. *American Antiquity* 69(2):43-52.

Fish, A.
2004. *A social history of the Lower Snake River*. On file at the United States Army Corps of Engineers office, Walla Walla District, Washington.

2005a. Indigenous digital media and traditional dramaturgy in the Pacific Northwest of North America. *Unpublished Article*. On file at the Center for Landscape and Artefact. Seattle, Washington.

2005b. Native American sacred places and the language of capitalism. *Future Anterior* 2(1).

Flatman, J.
2003. Cultural biographies, cognitive landscapes and dirty old bits of boat: 'theory' in maritime archaeology. *International Journal of Nautical Archaeology* 32(2):143-157.

Forbes, J. D.
1969. *Native Americans of California and Nevada*. Naturegraph Publishers, Happy Camp, California.

Foster, J. W., J. C. Bingham, C. Carter, K. Cooley-Reynolds and J. L. Kelly
1977. *The effect of inundation on the Pedersen Site, CA:ELD:201 Folsom Lake, California*. On file with California State Parks and Recreation Department.

Franco, M. and C. Sisk-Franco
2002. Winnemem Wintu position regarding Shasta Dam. Prepared for the Senate Selection Committee Hearings in Washington DC, June 4th, 2002, Washington D.C.

Fredrickson, D. A., J. L. Cox, V. D. Kaplan, S. M. Patterson and S. A. Stoddard
1977. The effects of freshwater immersion on cultural resources of the Coyote Dam-Lake Mendicino project area, Akiah, California.

Fullwood, J.
2002. 'Journey to justice' tells poignant tale of almost-forgotten California Tribe In *Canku Ota*. vol. Issue 64.

Gardner, M.
2005. Dream of restoring Hetch Hetchy Valley gets a fresh look. In *Daily Breeze*, Los Angeles.

Gates, G. R.
1978. *From dons to dams: the Van Norman Reservoir archaeological complex 1972-1975*, California State University Northridge.

Gold, S., E. Barry and S. Braun
2005. Misery and water keep rising. *Los Angeles Times*. Los Angeles, California.

Gould, R. A.
2000. *Archaeology and the social history of ships*. Cambridge University Press, Cambridge, United Kingdom.

Gould, R. A.
1985. *Shipwreck Anthropology*. University of New Mexico Press.

Green, W. and J. Doerchuk
1998. Cultural resource management and American archaeology. *Journal of Archaeological Research* 6(2):121-167.

Greer, S., R. Harrison and S. McIntyre-Tamwoy
2002. Community-based archaeology in Australia. *World Archaeology* 34(2):265-287.

Guelzo, A. C.
2006. The 'American system'. *History of the United States part 1, 2nd edition*. Audio class by The Teaching Company.

Guthrie, Woodie
1997. Talking Fishing Blues. *This Land Is Your Land*. Smithsonian Folkways Recordings.

Harrison, R.
2004. *Shared landscapes: archaeologies of attachment and the pastoral industry in New South Wales*. University of New South Wales Press, Sydney.

Hodder, I.
1986. *Archaeology as long-term history*. Cambridge University Press, Cambridge.

Hubbard, C.
2006. Grand Coulee Dam Photo Gallery. Dam Base Completed. http://users.owt.com/chubbard/gcdam/html/photos/construction.html Accessed on April 5th, 2005.

Hutter, M. and I. Rizzo
1997. *Economic perspectives on cultural heritage*. Macmillan Press, London.

Ingold, T.
1993. The temporality of the landscape. *World Archaeology* 25(2):152-174.

Jewell, D. P.
1961. Fresh-water archaeology. *American Antiquity* 26(3).

Jewell, P. A. and G. W. Quimby
1966. The experimental earthworks on Overton Down, Wiltshire England: the first four years. *The Prehistoric Society* (11):313-342.

Johnson, B.
2005. Queensland State Parks maritime archaeology fieldschool orientation, Townsville, Queensland.

Johnson, M.
1999. *Archaeological theory: an introduction*. Blackwell publishing, Oxford, United Kingdom.

King, T. F.
1998. *Cultural resource laws and practice: an introductory guide*. AltaMira Press, Walnut Creek, CA.

2002. *Thinking about cultural resource management: essays from the edge*. AltaMira Press, Walnut Creek, CA.

Layman, W.
2002. *Native River: the Columbia remembered*. Washington State University.

Lenihan, D.
1977. *The preliminary report of the national reservoir inundation study*. On file at the United States Department of the Interior, National Park Service, Southwest Cultural Resources Center, Santa Fe.

Lenihan, D., T. L. Carell, S. Fosberg, L. Murphy, S. L. Rahl and J. A. Ware
1981a. *The final report of the national reservoir inundation study volume I*. On file at the United States Department of the Interior, National Park Service, Southwest Cultural Resources Center, Santa Fe.

1981b. *The final report of the national reservoir inundation study volume II*. On file at the United States Department of the Interior, National Park Service, Southwest Cultural Resources Center, Santa Fe.

Lenihan, D. J.
1974a. Inundation Studies. In *Underwater archaeology in the national park service: a model for the management of submerged cultural resources* edited by D. J. Lenihan. On file at the United States Department of the Interior, National Park Service, Southwest Cultural Resources Center, Santa Fe.

1974b. *Underwater archaeology in the National Park Service*. On file at the United States Department of the Interior, National Park Service, Southwest Cultural Resources Center, Santa Fe.

Lenihan, D. J. and J. D. Brooks
1998. *Underwater wonders of the National Parks*. Fodor's Travel Publications, Oakland, California.

Lindstrom, S.
1990. Submerged tree stumps as indicators of mid-Holocene aridity in the Lake Tahoe Basin *Journal of California and Great Basin Anthropology* 12(2):146-157.

Lowry, W. R.
2003. *Dam politics: restoring America's rivers*. American governance and public policy. Georgetown University Press, Washington D.C.

Luna, P.
2005. Página de la Subdirección de Arqueología Subacuática. Instituto Nacional de Antropología e Historia, Merida, Mexico.

Masters, P. M. and N. C. Flemming
1983. *Quaternary coastlines and marine archaeology: towards the prehistory of land bridges and continental shelves*. Academic Press, London.

McCully, P.
2001. *Silenced rivers: the ecology and politics of large dams*. Zed Books, London.

McLeod, C.
2001. In the Light of Reverence. Sacred Land Film Project of Earth Island Institute.

McNiven I.J. and R. Feldman
2003 Ritually orchestrated seascapes: hunting magic and dugong bone mounds in Torres Straight, N.E. Australia. *Cambridge Archaeological Journal* 13 (2): 169-194.

Melley, B.
2004. Indian tribe conducts first war dance since 1887 to stop expansion of California's Shasta Dam. *San Francisco Gate*. San Francisco, California.

Montaigne, F.
2001. Columbia River. *National Geographic*, vol. 199: 2-33.

Murphy, D. E.
2004. At war against dam, tribe turns to old ways. *New York Times*. New York, New York.

N.E.A.
1996. Columbia River - Troubled waters, edited by N. E. Advocates. Riverwatch, Spokane.

N.O.A.A.
2001. *NOAA diving manual for science and technology*. 4th ed. Best Publishing Company. Flagstaff, Arizona.

Nordby, L. V.
1980. Preliminary experiments in the structural preservation of submerged Anasazi masonry units. In *The final report of the national reservoir inundation study*, edited by D. J. Lenihan. On file at the United States Department of the Interior, National Park Service, Southwest Cultural Resources Center, Santa Fe.

Norton, J.
1979. *When our worlds cried: genocide in Northwestern California*. The Indian Historian Press. San Francisco, California.

O'Halloran, C.
2001. '*Submerged Heritage*': *A study of threats to archaeological sites on the bottomlands of Lake Hume*, Charles Sturt University.

2002. Contamination of archaeological sites by waste from recreational boating and fishing. *Australian Journal of Environmental Management*
9:21-26.

O'Halloran, C. and D. H. R. Spennemann
2002. Wave action impact on archaeological sites in a freshwater reservoir: The case of Lake Hume, New South Wales *Australian Archaeology* 54: 6-12.

Oliver-Smith, A.
2006. Cultural heritage, dams and displacement: conflicting discourses. In *Damming the past: cultural heritage management and dams in global perspective* edited by S. Brandt and F. Hassan. Lexington Books, Lanham.

Ortolano, L. and K. K. Cushing
2000. *Grand Coulee Dam and the Columbia Basin Project, USA*

Parker, A. J.
2001. Maritime landscapes. *Landscapes* 2(1):22-41.

Parrish, M. E.
1992. *Anxious Decades*. W.W. Norton, London.

Pawson, M. and D. Buisserret
1975. *Port Royal, Jamaica*. Oxford University Press, Oxford.

Pearson, M. and M. Shanks
2001. *Theatre/archaeology*. Routledge, London, United Kingdom.

Rayl, S. L., S. L. Fosberg, D. J. Lenihan, L. V. Nordby and J. A. Ware
1978. Glen Canyon revisited: the effects of reservoir inundation on submerged cultural resources In *The final report of the national reservoir inundation study volume II*, edited by D. J. Lenihan. On file at the United States Department of the Interior, National Park Service, Southwest Cultural Resources Center, Santa Fe.

Read, P.
1996. *Returning to nothing, the meaning of lost places*. Cambridge University Press, Cambridge.

Renfrew, C. and P. Bahn
2001. *Archaeology: theories, methods, and practice*. Thames and Hudson Ltd., London.

Ridings, R.
1996. Where in the World Does Obsidian Hydration Dating Work? *American Antiquity* 61(1).

Ritscher, A.
2004. Native Americans Fight Shasta Dam Expansion. In *Socialist Action*. San Francisco, California.

Romey, K.
2004. Diving the Maya underworld. In *Archaeology Magazine* vol. May/June: 16-23.

Ross, Kimberly
2006a. Right of Passage, Teen Girl Undergoes Tribal Coming of Age Ceremony. *Redding Record Searchlight*. Redding, CA.

2006b. Ceremony needs space, Public Asked to Respect Voluntary Closure in Forest. *Redding Record Searchlight*. Redding, CA.

Ross, L. A.
1969. *Archaeological investigation in the Coulee Dam National Recreation Area, Spring 1969*. Laboratory of Anthropology, Washington State University.

Scudder, T.
2005. *The future of large dams: dealing with social, environmental, institutional and political costs*. Earthscan Publication Ltd.,, London.

Shanks, M. and C. Tilley
1987. *Reconstructing archaeology*. Cambridge University Press, Cambridge, United Kingdom.

Shen, C.
2006. Mission impossible: current archaeological practices in the Three Gorges Reservoir, China. In *damming the past*, edited by S. Brandt and F. Hassan. Lexington Books, Lanham, MD.

Sisk-Franco, C.
2005. Interview with the International Centre for Archaeology Underwater. Redding, California.

Smith, C. E. and W. D. Weymouth
1952. *Archaeology of the Shasta Dam area, California*. University of California.

Smith, L.
2004. *Archaeological theory and the politics of cultural heritage*. Routledge, London.

Smith, R. C.
2000. *The maritime heritage of the Cayman Islands*. New perspectives on maritime history and nautical archaeology. University Press of Florida, Gainesville.

Terkel, S.
1986. *Hard times: An oral history of the Great Depression*. New Press, New York.

Thomas, J.
2001. Archaeologies of place and landscape. In *Archaeological theory today*, edited by I. Hodder. Blackwell Publishing, Cambridge, United Kingdom.

Tilley, C.
1994. *A Phenomenology of Landscape : Places, Paths and Monuments (Explorations in Anthropology)*. Berg Publishers, Oxfordshire, United Kingdom.

Treganza, A. E.
1954. *Salvage archaeology in Numbus and Redbank reservoir areas, central California*. University of California.

1958. *Salvage Archaeology in the Trinity Reservoir Area, Northern California: Field 1958*. Coyote Press.

Trigger, B.
1984. Alternative archaeologies: nationalist, colonialist, imperialist. *Man* 19.

U.S.A.C.E.
2005. National Inventory of Dams. United States Army Corps of Engineers. http://crunch.tec.army.mil/nid/webpages/nid.cfm. Accessed 10th February 2006.

UNESCO
1998. *First framework programme in support of culture (2000-2004)*. Commission of the European Communities.

Ware, J., S. Rayl and S. Fosberg
1979. The assessment of freshwater inundation impacts on cultural resources: an experiment in differential preservation. In *The final report of the national reservoir inundation study volume II*, edited by D. J. Lenihan. On file at the United States Department of the Interior, National Park Service, Southwest Cultural Resources Center, Santa Fe.

WCD
2001. *Dams and development: a new framework for decision making* World Commission on Dams. Earthscan Publication Ltd., London.

White, N. M.
2000. Archaeological resurvey after the dam. Paper presented at the International Workshop on Cultural Heritage Management and Dams Gainesville, Florida.

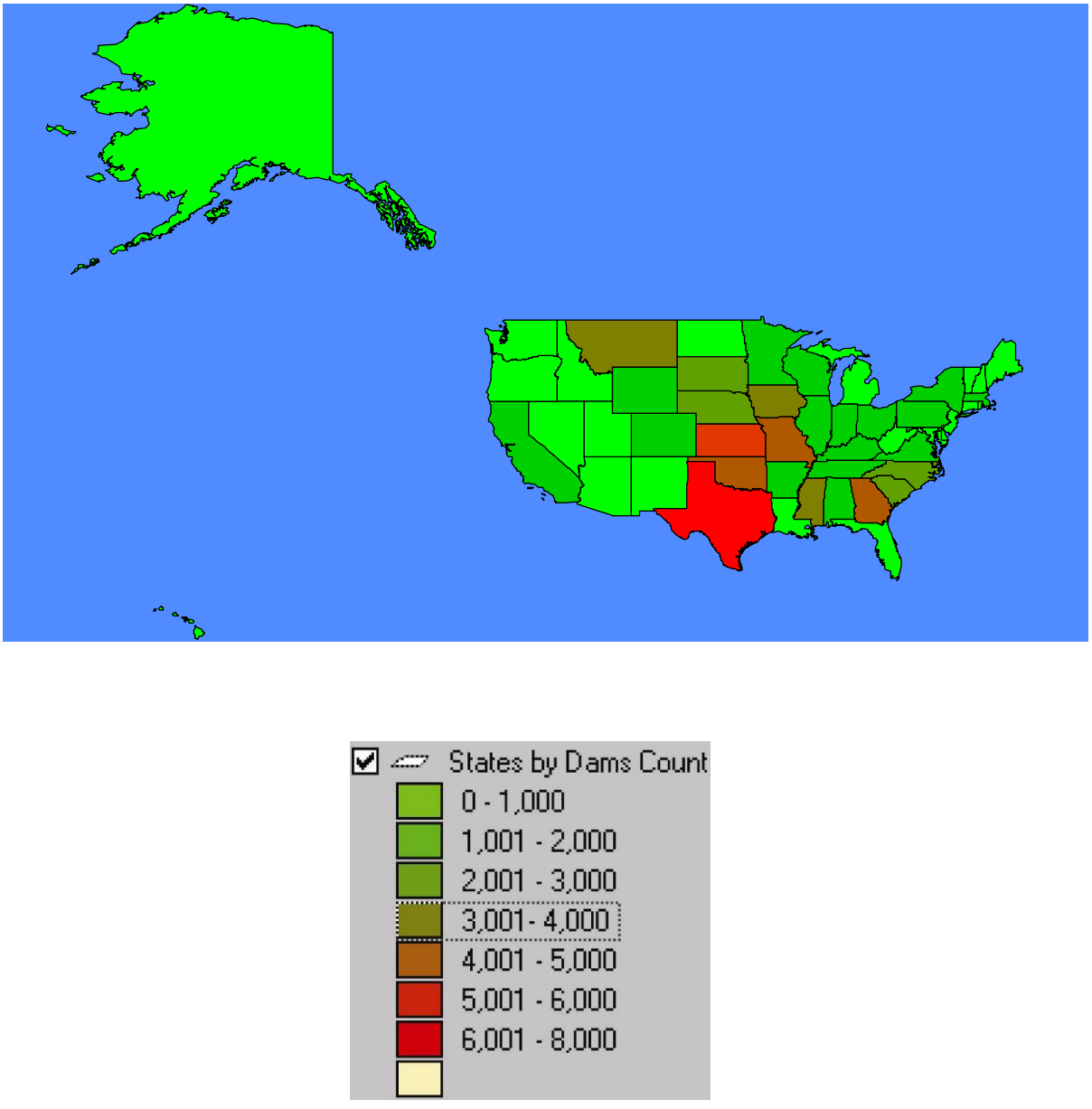
Yourcenar, M.
1957. *Mémoires d'Hadrien*. Doubleday Anchor Books, New York.

Zilhao, J.
1995. A victory for rock art in Portugal. Society of American Archaeology. Society for American Archaeology. http://www.saa.org/publications/saabulletin/14-1/SAA14.html. Accessed 7th January 2006.

Appendix: Additional Maps

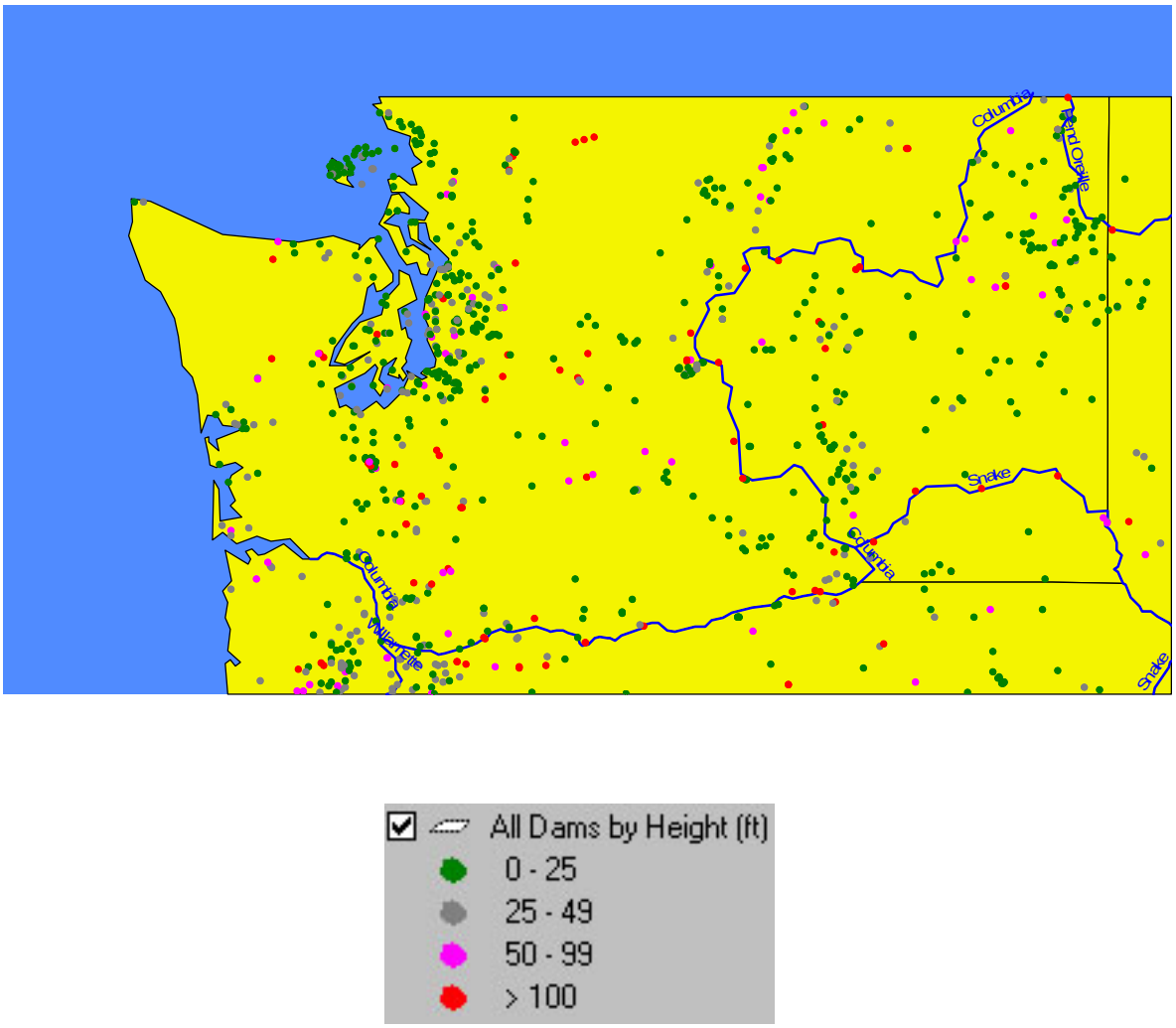
MAP I

Army Corps of Engineers map of large scale dam distribution in the USA[11]



[11] Image obtained from the United States Army Corps of Engineers National Inventory of Dams database at http://crunch.tec.army.mil/nid/webpages/nid.cfm

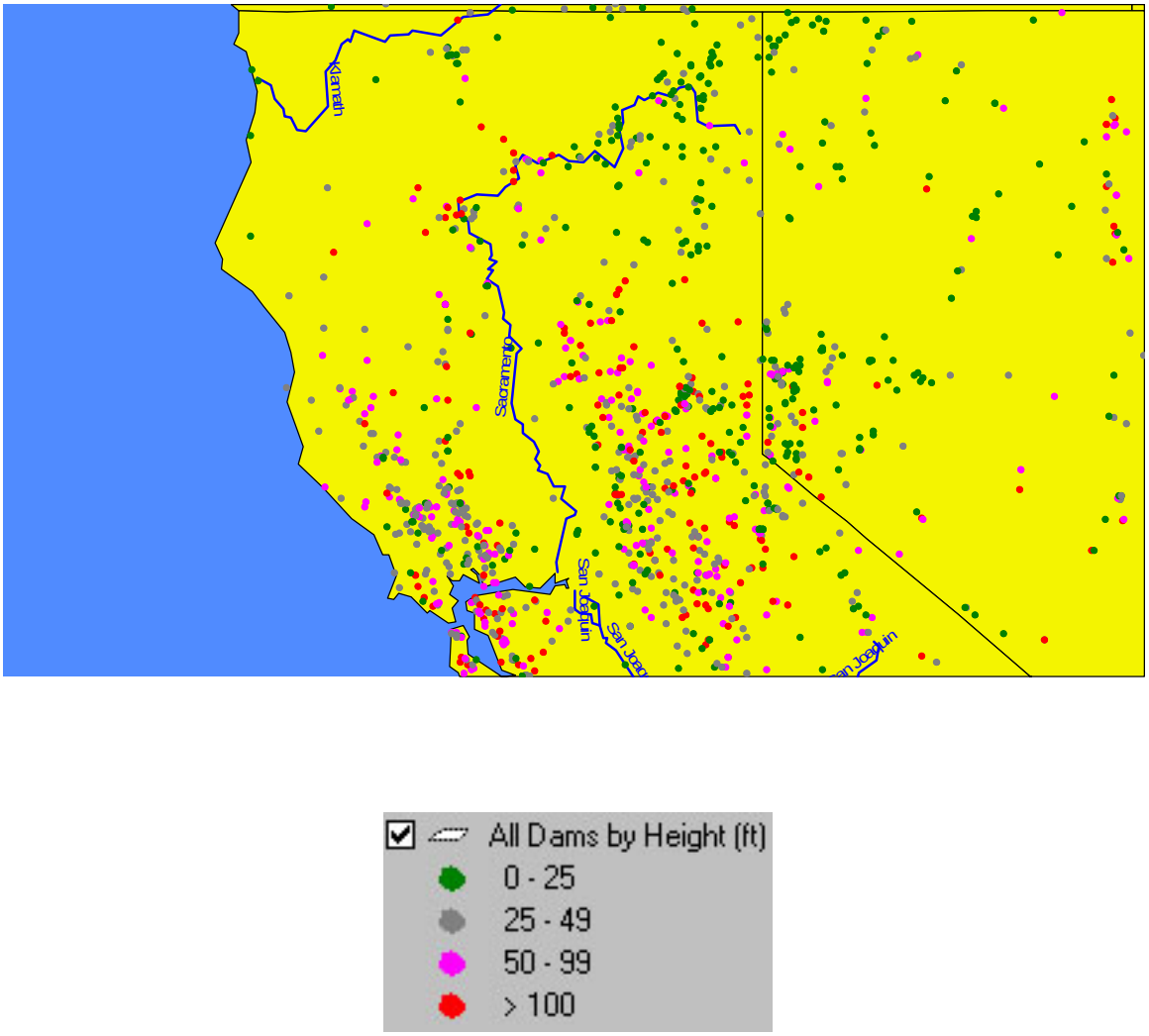
MAP II
Dams of Washington State, USA by height[12]



[12] Image obtained from the United States Army Corps of Engineers National Inventory of Dams database at http://crunch.tec.army.mil/nid/webpages/nid.cfm

MAP III

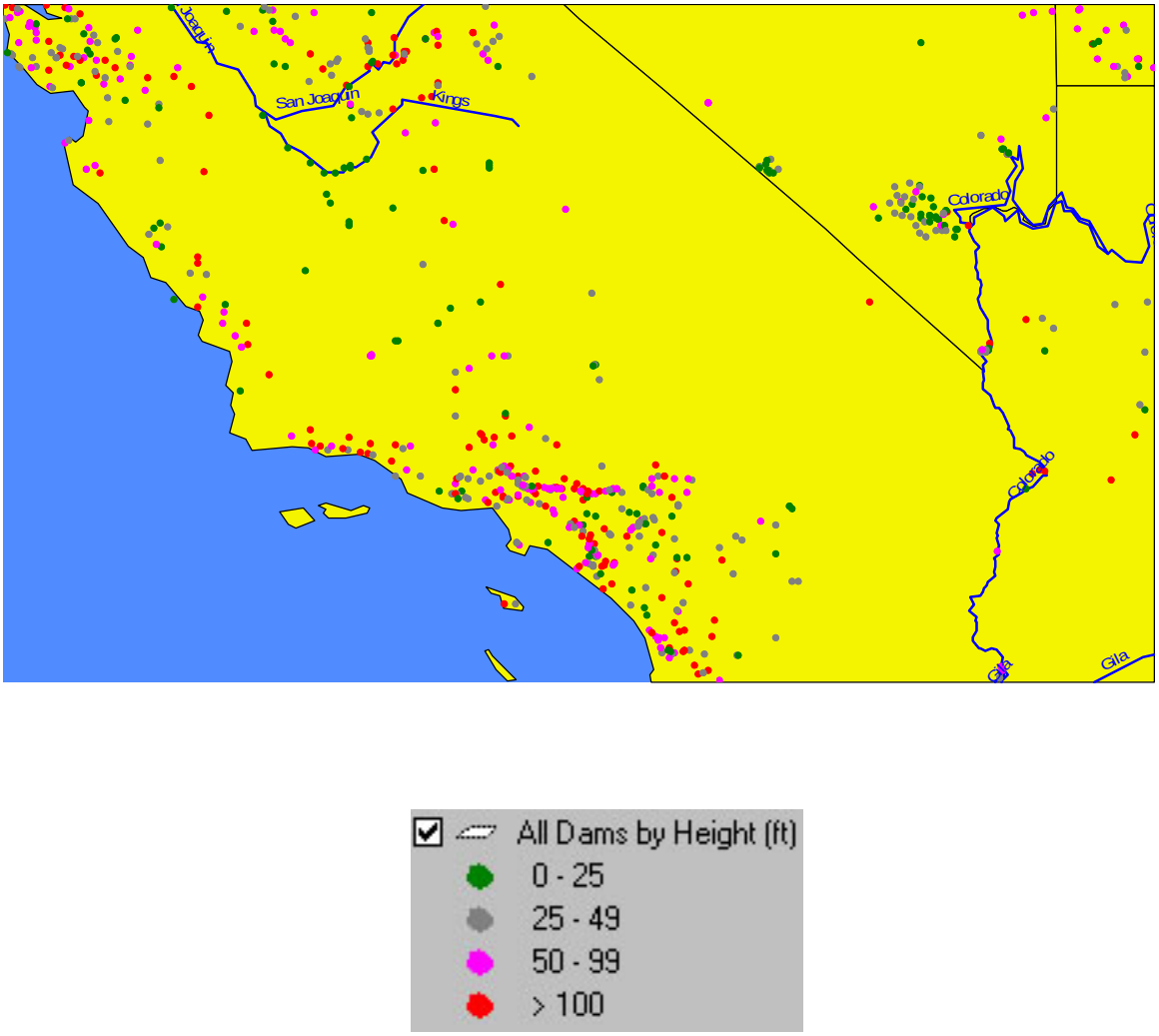
Dams of Northern California and Western Nevada, USA, by height[13]



[13] Image obtained from the United States Army Corps of Engineers National Inventory of Dams database at http://crunch.tec.army.mil/nid/webpages/nid.cfm

MAP IV

Dams of Southern California and Southern Nevada, USA, by height[14]



[14] Image obtained from the United States Army Corps of Engineers National Inventory of Dams database at http://crunch.tec.army.mil/nid/webpages/nid.cfm