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BOEM 2018-055

Developing Protocols for Reconstructing Submerged Paleocultural Landscapes and Identifying Native American Archaeological Sites in Submerged Environments: Best Practices

US Department of the Interior
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ABOUT THE COVER

The Submerged Paleocultural Landscapes Project team, research partners, and friends at the conclusion of a June 2016 offshore capacity-building cruise on board the University of Rhode Island's research vessel R/V *Endeavor*.

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Lexicon

The following terminology may have various meanings and implications for individuals from diverse groups. The descriptions below provide clarification about how these terms are used in this document.

Archaeological Site: A geographic area where material culture (i.e., physical remains features and artifacts) correlating to past human activity are present.

Model: In general, a process, object, map of two or three dimensions, or an illustration that helps to visualize or predict something. This term has multiple meanings and implications and should be defined clearly each time it is used. See Section 3.7.1 of this document for detailed discussion of the use of the term model in the context of paleocultural sensitivity assessments.

Paleo: A prefix meaning old or ancient. Frequently used in the geological sciences to refer to the past. For example, "paleoclimate" means "ancient climate." "Paleo," as defined here, is a general term that does not imply a particular time or have any connection to an archaeologically identified period or Native American cultural period in the past (i.e., the "PaleoIndian Period"). The prefix should never be confused with, or used interchangeably with the term "prehistoric," which is an arbitrary distinction between Euro-American time and all other concepts of time. Prehistoric also has been used as the division between time periods as defined by Euro-American contact and presence with the implication that "history" did not begin until their arrival to the Americas. Consequently, the term is seen as inaccurate and offensive to many Native people, whose history extends thousands of years into the past. Although the language of the National Historic Preservation Act (NHPA), Section 106 implementing regulations, and certain regulatory agency documents still use the term "prehistoric" and it is not intended to be offensive, it is still problematic for some Native peoples. Use of the term "pre-contact" is preferable.

Paleotopography: Old or ancient topography, describing the physical configuration of the old or ancient land surface, frequently with respect to elevation. For example, Western Maine is characterized by mountainous topography, whereas most of Rhode Island has low-lying topography. Note that this term refers to the natural environment only, without any implication regarding the cultural use or importance of a geographic area.

Paleoenvironment: Old or ancient environment, describing the ecological and climatic characteristics of a geographic area. For example, a paleo-land surface may be characterized by lakes and rivers, with vegetation indicative of cold climates. Note that this term refers to the natural environment only, without any implication regarding the cultural use or importance of the environment.

Paleolandscape: The combination of the paleotopography and paleoenvironment of a geographic area. Using the term "paleolandscape" in this report implies a comprehensive understanding of the natural environment in a geographic area. Note that this term refers only to the physical characteristics of an area, not to the cultural use or importance of the area.

Paleocultural Landscape: An old or ancient landscape that was inhabited or modified by humans, and/or a landscape that is perceived by contemporary Native communities as having cultural importance to them since ancient times.

Paleocultural Sensitivity: The potential for paleocultural sites to be present within a given geographic area.

Paleocultural Sensitivity Assessment: An assessment in which cultural and environmental variables are examined to determine the potential for paleocultural sites to be present within a given geographic area.

Paleocultural Site: A site with evidence of old or ancient cultural activity or importance.

Paleocultural Site Identification Survey: A geoarchaeological survey done to identify paleocultural sites within a given geographic area.

Reconstruction*:* A representation of something that no longer exists or cannot be viewed directly based on scientific and cultural data obtained through evidence-based geoscientific, archaeological, and ethnographic research. The focus of reconstructions can be geographically, chronologically, and culturally narrow or broad according to the types of data available, and the needs and goals of the project.

Relative Sea Level: A local or regional measurement of sea level that takes into account both the changes in the height of the ocean resulting from the melting of glacial ice or warming seas (known as "absolute" or "eustatic" sea level change), as well as changes in the level of the ocean caused by tectonic shifts (the underlying land rising or falling with respect to the ocean surface).

Subaerially Exposed Sediments: Sediments that are, or have been, exposed to air.

Study, Survey, or Project Area: The geographic space and/or location that is being investigated where geoarchaeological investigation activities take place. The general term "study area" is used throughout this document because of its broader applicability to different types of investigations.

Tribal Knowledge, Traditional [Ecological] Knowledge: A cumulative body of knowledge, practice, and belief, evolving by adaptive processes and handed down through generations by cultural transmission. It concerns the relationship of living beings (including humans) with one another and with their environment (Ball, et al., 2015).

1.0 Introduction

1.1 Project Background

The Outer Continental Shelf (OCS) of the United States is increasingly the focus of proposed renewable, oil, and gas development to meet the nation's energy objectives. The effects these activities may have on submerged Tribal* historic properties inundated by post-glacial sea level rise is a significant concern for the United States Department of the Interior's (DOI) Bureau of Ocean Energy Management (BOEM), individual states, Tribal Historic Preservation Officers (THPOs), and other regulatory agencies and interested parties. During BOEM's 2011 Atlantic Wind Energy Workshop, participants identified the development of geospatial databases of known submerged Tribal cultural sites, and the development of standardized survey methodologies for locating previously unidentified sites as management priorities (Cahill et al., 2011).

The identification of these management needs also resulted in a discussion about the need for "best practices" that could inform and assist BOEM in revising their then-current "Geophysical, Geological and Archaeological Guidelines" ("GGARCH") (DOI-BOEM 2012). Revisions to these guidelines were needed to provide more detailed recommendations for reconstructing submerged paleocultural landscapes and identifying archaeological evidence of submerged Tribal cultural sites within them, as part of the historic properties identification element of the National Historic Preservation Act (NHPA), Section 106 compliance process.

In response to these needs, the University of Rhode Island's Graduate School of Oceanography (URI-GSO) and its research partners, the Rhode Island Coastal Resource Management Council (CRMC) and the Narragansett Indian Tribal Historic Preservation Office (NITHPO), submitted a joint proposal to BOEM in 2012, "Developing Protocols for Reconstructing Submerged Paleocultural Landscapes and Identifying Ancient Native American Archaeological Sites in Submerged Environments" (hereafter, "the project" or "the Submerged Paleocultural Landscapes Project"). This proposal led to a cooperative agreement between the State of Rhode Island and BOEM (with CRMC, URI-GSO, and NITHPO as research partners) to conduct a five-year study consisting of multi-disciplinary investigations of five nearshore and offshore areas in Rhode Island waters. The primary goal of the project was to develop and test best practices for five interrelated processes: 1) paleolandscape reconstruction; 2) paleoenvironmental reconstruction; 3) predictive modeling; 4) submerged site identification; and 5) integrating Tribal knowledge and perspectives into all aspects of the paleocultural sensitivity assessment and identification process.

During the course of the project, BOEM's recommendations for providing geoarchaeological information for site characterization studies on the OCS were updated. In 2015, the GGARCH was split into two separate documents: 1) "Guidelines for Providing Archaeological and Historic Property Information" (BOEM Arch GL) (DOI-BOEM 2015a); and 2) "Guidelines for Providing Geophysical, Geotechnical, and Geohazard Information" (BOEM G&G GL) (DOI-BOEM 2015b). The former was updated to include guidance on developing submerged paleocultural landscape reconstructions. The BOEM Arch GL was updated again in March 2017 (DOI-BOEM 2017), retaining the guidance on developing paleolandscape reconstructions. The best practices presented in this document are intended to clarify and expand upon the guidance in the 2015 and 2017 documents, and to be of more general use in assisting agencies, Tribal

*In this document, the term "Tribal" or "Tribe" is used to represent *all* Native American indigenous communities, regardless of recognition status. Indigenous groups' interests in ancestral territory and resources, and the validity of their traditional knowledge and cultural practices, is not dependent on federal or state recognition status.

communities, and researchers who work together in the identification of submerged Tribal historic properties as part of the NHPA Section 106 compliance process.

1.2 Document Scope and Goals

The intent of these best practices is to improve the effectiveness and appropriateness of the Tribal engagement and geoarchaeological research that forms the basis for successful government-to-government consultation associated with proposed Federal undertakings. The existing BOEM guidance documents referenced above establish goals for conducting identification surveys in submerged environments, and for consultation between Federal agencies and Tribal communities. But what is less well-developed in these documents is:

1. An understanding of how to engage Tribal communities more effectively in research concerning the identification of submerged Tribal cultural sites and related consultation processes through the development and maintenance of effective, culturally sensitive, and collaborative relationships. These relationships are equitable partnerships that value information and ways of knowing contributed from diverse knowledge systems (e.g., traditional ecological knowledge) and bring reciprocal benefits to each partner that builds capacity in many ways.
2. A clearly defined strategy about conducting submerged cultural resources sensitivity assessments and site identification research.

Respectful engagement and collaborative relationships are the foundation for mutually beneficial and successful consultation. What appears to have been largely absent from most previous Federal agency guidance documents has been recommended procedures about how to establish and develop these relationships before engaging in the consultation process. Consultation cannot be expected to function optimally without an established basis of respectful and effective communication, trusting and mutually beneficial relationships, and shared capacities among the involved groups to become and remained engaged as collaborative partners.

The geoarchaeological study area characterization and site identification processes outlined in BOEM guidance documents are revised periodically to reflect methodological developments. The most recent versions of these documents (i.e., DOI-BOEM 2015a; DOI-BOEM 2015b) do not include standardized definitions of key terminology, or a detailed step-by-step process for characterizing submerged paleocultural landscapes and identifying sites that may be applied to any geographic area. Also not included is detailed guidance regarding the types, uses, limitations and pitfalls of geoarchaeological predictive modeling.

This document addresses these underlying issues and provides new insights regarding relationships with Tribal communities from the perspective of people working within the various existing regulatory and developmental collaborative relationship frameworks. It is intended to provide recommendations concerning the actual steps that are required to achieve the stated goals of Federal and State agency assessment and identification guidance documents. ***This document is not intended to provide new standards to be implemented during consultation.*** Instead, the best practices in this study are intended to be informational, and to support Federal and State agencies, Tribal communities, and researchers. ***Any actual changes to BOEM's or any other agency's archaeological survey guidelines and/or Tribal consultation policies would be considered and implemented in consultation with Tribal communities and other appropriate consulting parties.***

1.3 The Best Practice Approach, Purpose, and Sources

"Best practices" is a management approach that describes methods of achieving results under specific circumstances in optimally effective and appropriate ways. For a method or idea to be considered a best practice, it must have certain characteristics, which include the ability and the desire to be duplicated and implemented by others. Rapidly evolving management needs, preservation concerns, and technological developments require that best practices be dynamic, and continually updated and improved. Developing best practices involves the transfer of lessons learned from one individual or group to another, allowing the recipient of the best practices to focus on the actual performance of the tasks at hand, rather than on analyzing the best ways to accomplish them. Implementing best practices saves time and effort, and usually produces a more consistent and beneficial set of outcomes. A best practices approach has long been applied to different applications, such as agriculture and forestry (USDA Forest Service 2012), but it has only been widely adapted to cultural resources management (CRM) within the last 15 years (NATHPO 2005; UNESCO World Heritage Centre 2013).

The best practices presented in this document were developed from the following project-related experiences and reviewed resources:

1. The URI-GSO research partners' 2013 Initial Project Workshop (Coastal Mapping Laboratory 2015)

2. The "Inter-Tribal Workshop" held on September 17, 2015 at the Narragansett Indian Tribal Longhouse

3. 2011 DOI Tribal Consultation Policy (512 DM 4: Department of the Interior Policy on Consultation with Indian Tribes and Alaska Native Corporations (November 2015) and 512 DM 5: Procedures for Consultation with Indian Tribes)

4. BOEM Annual Tribal Consultation Report Fiscal Year 2014 (Ewald et al. 2015)

5. Appendix 3 Final BOEM TWG Recommendations—"Recommendations for the Development of BOEM's Tribal Consultation Guidance*"* (BOEM Tribal Consultation Policy Working Group 2014)

6. BOEM Tribal Consultation Guidance, May 05, 2014 (DOI-BOEM 2014)

7. BOEM Guidelines that were current in 2012 at the start of the project (DOI-BOEM 2012)

8. BOEM "Guidelines for Providing Archaeological and Historic Property Information Pursuant to 30 CFR Part 585", revised in 2015 ("BOEM Arch GL") (DOI-BOEM 2015a) and in 2017 (DOI-BOEM 2017)

9. BOEM "Guidelines for Providing Geophysical, Geotechnical, and Geohazard Information Pursuant to 30 CFR Part 585", revised in 2015 ("BOEM G & G GL") (DOI-BOEM 2015b)

10. All references included in the (DOI-BOEM 2015a) document (Coastal Environments, Inc. [CEI] 1977; Evans 2015; Faught 2014; National Register of Historic Places, 2002; TRC Environmental Corporation [TRC] 2012; Westley et al. 2011)

11. "Tribal Consultation Best Practices Guidelines" (Northeast Regional Planning Body's Tribal Working Group 2016)

12. “In Their Own Light: A Case Study in Effective Tribal Consultation” (Federal Highway Administration [FHWA] Resource Center 2008)

13. “Improving Tribal Consultation in Infrastructure Projects: A Report by the Advisory Council on Historic Preservation” (Advisory Council on Historic Preservation [ACHP] 2017)

14. Community Tool Box, Chapter 24: Section 3. “Promoting Coordination, Cooperative Agreements, and Collaborative Agreements Among Agencies” (Axner 2016)

15. “A Guidance Document for Characterizing Tribal Cultural Landscapes” (Ball et al. 2015)

16. “Reclaiming Our Past: A New Role for Native Americans in the Archaeology of Southern New England” (Gould and Thomas 2004)

17. “Phase I Marine Archaeological Survey: Block Island Wind Farm, Block Island Transmission System, and Block Island Alternative Projects, North Atlantic Ocean, New Shoreham and Narragansett, Rhode Island.” Technical Report prepared for Deepwater Wind, LLC, Providence, RI, by Fathom Research, LLC, Portsmouth, RI (Robinson et al. 2012)

18. “Research Design for Collaborative Baseline Survey Offshore Massachusetts: A Prototype for Partnerships in Sound Science.” Prepared for the U.S. Department of the Interior’s BOEM, Herndon, VA, by the University of Rhode Island Graduate School of Oceanography, Narragansett, RI (King et al. 2012)

19. The project team’s pre-existing knowledge and the newly acquired knowledge gained from the project's field work, data analysis, and discussions between project team members and interested Tribal community representatives

Though some of the best practices that follow may apply directly to the recommended standards of BOEM's Guidelines or to the NHPA Section 106 compliance process, others may not. Those that are not easily applied to the Section 106 process are included because they represent important concepts and actions related to specific scientific processes or to the engagement of Tribal community representatives as active research partners. A central objective of the project was to conduct scientific research in a manner that incorporates Tribal concerns, knowledge, values, and personnel (see Section 2.0 of this document for further discussion).

Best practices should be dynamic recommendations that require periodic updating as new information, technologies, ideas, and priorities become available and evolve over time. This dynamism and the significant need for baseline archaeological data for the offshore environment is particularly true of the recent and rapidly developing marine archaeological sub-discipline of “submerged settlements archaeology.” Though these best practices were created within a southern New England (Rhode Island) geographic research context, they are intended to be broadly applicable to multiple geographic areas and are part of a growing body of similar documents being produced in collaboration with Tribal groups around the country (e.g., see ACHP 2017; Ball et al. 2015; DOI 2011; Northeast Regional Planning Body’s Tribal Working Group 2016). It should be recognized, however, that no single methodology is equally effective or appropriate for all environments, regions, or sites (Flatman and Evans 2014).

1.4 Document Organization

This document is organized into four sections. Section 1 (Introduction) presents information on the project background, describes the project's scope and goals, defines the meaning of “best practices,” and provides a brief definition and clarification of key terms that are used most frequently throughout the document. Section 2 (Best Practices for Agency, Tribal, and Research Community Engagement) presents the recommended best practices in support of submerged paleocultural landscape characterization and historic properties identification and protection. Before conducting the research necessary to identify and protect submerged paleocultural landscapes and any historic properties they may contain, all parties involved in the process need to understand how they can communicate with and relate to each other in optimal ways, and to know what kind of capacities are necessary for successful collaboration and consultation to occur. Section 3 (Best Practices for Assessing Paleocultural Sensitivity) presents guidance for assessing paleocultural sensitivity on the OCS and includes expanded descriptions and additional recommendations for the sequence and scope of collaborative research steps performed to characterize paleolandscapes and identify submerged paleocultural historic properties located within them. Section 4 (Conclusions and Next Steps) presents a summary of the document's contents with concluding remarks and recommended next steps for implementing the recommendations that are included in this document.

2.0 Best Practices for Agency, Tribal, and Research Community Engagement in Support of Submerged Paleocultural Landscapes and Historic Properties Identification and Protection

This section focuses on synthesizing the shared information, knowledge and experience gained by the project team during the course of the Submerged Paleocultural Landscapes Project with respect to agency, Tribal, and research community engagement. The purpose of these best practices is to support the DOI's and BOEM's goals for developing and promoting the respect, enhanced communication, trust, transparency and shared responsibility elements of their consultation policies, as articulated in these publicly available documents:

- DOI Policy on Consultation with Indian Tribes (DOI 2011); and,

- Appendix 3: Final BOEM TWG Recommendations- Recommendations for the Development of BOEM's Tribal Consultation Guidance, in the DOI Departmental Manual, Series 30– Intergovernmental Relations (Part 512, DM Chapter 2–American Indians and Alaskan Native Programs (BOEM Tribal Consultation Policy Working Group 2014).

Best practices presented herein assist in accomplishing the goals of BOEM and the entirety of DOI by:

1. Drawing a clear distinction between the more prescribed and restrictive relationships among agencies and Tribal communities that characterize formal consultation in a regulatory environment, and the less restrictive collaborative relationship that can exist among agencies, Tribal communities, and researchers when working together for mutually beneficial purposes.

2. Addressing the foundation principles necessary for building improved, mutually beneficial, and meaningful collaborative relationships among agencies, Tribal communities, and researchers.

3. Identifying areas where challenges and deficits in capacity exist among all three of these diverse groups and recommending how to meet and productively address them.

2.1 Current Framework for Relationships Between Tribes and Federal Agencies

The obligation for Federal agencies to engage with Tribes on a government-to-government basis is predicated upon the U.S. Constitution and Federal treaties, statutes, executive orders, and policies, which agencies meet in part through formal consultation (DOI 2011). Direction and guidance for all Federal agencies to "establish regular and meaningful consultation and collaboration with Tribal officials" in the development of Federal policies that have Tribal implications, to strengthen the U.S. government-to-government relationships with Tribes, and to reduce the imposition of unfunded mandates upon Tribes, are provided by President Clinton's 2000 Executive Order (EO) 13175, and by President Obama's subsequent 2009 Presidential Memorandum on EO 13175. EO 13175, and the American Indian Religious Freedom Act (AIRFA) (16 U.S.C. 1997), the Archaeological Resources Protection Act of 1979 (ARPA) (16 U.S.C. 470aa-mm[†]), and the NHPA (54 U.S.C. 300101 et seq.), among others, provide government-wide requirements for consultation with Tribes. However, each Federal department, agency, and bureau is

[†] Although the ARPA provides direction and guidance for Federal agencies and their policies concerning consultation and collaboration with Tribes, ARPA, by Congressional exclusion, does not apply to the Outer Contiental Shelf.

responsible for defining what “consultation” means to them, and for developing their own set of written policies guiding the consultation process. As a result, there are differences among each agency's version of the government-wide consultation policy. These differences arise in the absence of a single government-wide Federal consultation standard, and have led to confusion over what formal consultation is, what specific procedural steps are required, with whom, when, and where precisely, to accomplish formal consultation, ultimately resulting in dozens of court cases around the subject of the quality, timeliness, and procedural appropriateness of Tribal consultation activities. This confusion, frustration, and a desire for a single Federal standard for formal government-to-government consultation was clearly articulated in the comments received from 59 Tribes and eight inter-Tribal organizations during meetings and listening sessions hosted by the DOI and the U. S. Army Corps of Engineers (USACE) in 2016 to discuss with Tribes their input in Federal infrastructure decisions in response to the widespread concerns regarding the Dakota Access Pipeline. These comments and the ACHP’s responses are included in the May 24, 2017 report by ACHP: “Improving Tribal Consultation in Infrastructure Projects” (ACHP 2017).

The “DOI Tribal Policy on Consultation with Indian Tribes” document (2011) states that consultation is a deliberative process that aims to create effective collaboration and informed Federal decision-making. It asserts that communication is intended to be open and transparent without compromising the rights of Tribes or the government-to-government formal consultation process. The DOI Tribal consultation document states further that Federal consultation conducted in a meaningful and good-faith manner facilitates effective DOI operations and governance practices. The 2011 DOI document also states that efficiencies derived from the inclusion of Tribes in the DOI's decision-making processes through Tribal consultation will help ensure that future Federal action is achievable, comprehensive, long-lasting and reflective of Tribal input. Section V of the 2011 DOI Tribal consultation guidance document further specifies that the DOI will design training for its staff and Tribal staff “aimed at improving the Department's capacity for promoting collaboration” with Tribes, in support of executing the consultation provisions of the DOI document. Elements of this training are designed to focus on promoting not only consultation, but also “communication, collaboration, and other interaction with Tribes,” and to “highlight and provide the knowledge, skills and tools necessary for collaborative engagement” between agency and Tribe. The 2011 DOI “Policy on Consultation with Indian Tribes” document strives for “innovation” and enhancement of “mutual understanding of cultural perspectives and administrative requirements between Tribal and Federal agency officials, and to promote inter-governmental relationships.” In planning formal consultation, DOI encourages its Bureaus and Offices to “consider best practices for engagement” of Tribes, including, but not limited to, “collaborative problem solving approaches to promote effective dialogue and conflict resolution.”

The “Recommendations for the Development of BOEM’s Tribal Consultation Guidance” in “Appendix 3: Final BOEM TWG Recommendations” of the DOI Departmental Manual’s Section 512, prepared by the BOEM Tribal Consultation Policy Working Group (BOEM 2014), echoes that of the DOI’s 2011 “Policy on Consultation with Indian Tribes” document, but emphasizes the importance of conducting "informal Tribal outreach" as "a critical element in developing effective Tribal consultation guidance that is built on cooperation, trust and transparency," and as a necessity for developing Tribal consultation plans that are tailored by region. The 2014 BOEM Final TWG Recommendations document draws a distinction between “consultation” and “communication” and “consultation” and “engagement,” but notes that these actions share important connections for building Tribal relationships. Through the development of improved relationships with Tribes, BOEM asserts that communication, trust, and transparency will be enhanced and that Freedom of Information Act (FOIA) requests and litigation will be reduced, benefitting both groups. The 2014 BOEM Tribal consultation guidance document also recommends staff training to “prepare staff for Tribal interactions,” and notes that a “successful consultation program requires sufficient staffing equipped with appropriate knowledge, responsibilities, corresponding authorities, and lines of communication,” and a “clear staffing framework” for BOEM's Tribal consultation activities.

The Presidential Executive Order and memo, and DOI and BOEM's guidance documents discussed above, clearly articulate the goals for Tribal engagement and consultation and the importance of respectful and mutually beneficial collaborative relationships. However, the actual steps for developing the relationships required to support the achievement of those goals are not well-defined. Multicultural collaborations require relationships characterized by significant personal sensitivity, time commitments, and respectful understanding of varying priorities, communication styles, and world views. This requirement is particularly true when historical relationships between collaborating cultural groups are characterized by painful historical legacies.

2.1.1 The Power of Positive Relationships: A Case Study of Building Agency-Tribal Collaboration and Consultation

Building long-term personal and professional collaborative relationships between agencies and Tribal representatives creates a climate of mutual trust that is the requisite foundation for moving forward with meaningful consultation of any kind. An instructive example of this best practice-type of relationship is the efforts over the last ten years of the North Dakota Department of Transportation (NDDOT), the U.S. Department of Transportation Federal Highway Administration (FHWA) North Dakota Division, and the 15 different Tribes they have worked with who have current and/or ancestral ties to what is now North Dakota. Described in detail in the FHWA Resource Center's 2008 publication, "In Their Own Light: A Case Study in Effective Tribal Consultation" (FHWA Resource Center 2008), these efforts came after NDDOT and FHWA recognized that the actual implementation of Tribal consultation procedures was less than optimal and did not at that time (i.e., during the 1990s) consider the expanded role of Tribes in the NHPA Section 106 project review process. This expanded role came because of the 1992 amendments to the NHPA that required the inclusion of Tribes during the consideration of effects to historic properties. However, what was missing from the 1992 amendments were the implementing regulations to guide the process (an issue that was eventually addressed in the 1999 amendment to the NHPA). NDDOT's cultural resource management staff decided, working with the FHWA, to approach these changes proactively to fulfill not only the letter of the law, but also its intent, by partnering with the Tribes to consider the effects of transportation projects on places of cultural importance within North Dakota (FHWA Resource Center 2008). NDDOT and FHWA also recognized that the consideration of Tribal interest in the preservation of significant cultural sites was not only important to Tribal well-being, growth, and prosperity, but also allowed for a clearer understanding of relevant issues and concerns. Greater Tribal involvement led to better decision-making, more effective cultural resource management, more acceptable outcomes for all stakeholders, and, ultimately, savings in the delivery of transportation projects (FHWA Resource Center 2008). Though FHWA could not and did not delegate its government-to-government responsibility and overall consultation and coordination duties, the agency did, upon receiving agreement from the Tribes, rely on NDDOT to carry out its day-to-day and project-specific consultation, as specified in Section 800.2(c)(4) of the Section 106 regulations. Initially, traditional and cultural spiritual leaders and Tribal elders of individual Tribes were consulted and included in the decision-making process for several FHWA and NDDOT on a project-to-project basis when archaeological evidence of Tribal cultural sites was identified. Tribal representatives were taken to visit the sites, asked what they knew about the area, and, more important, asked what they thought needed to be done. Information deemed to be non-sensitive by the Tribes was included in reports and recommendations; Tribally sensitive information was not. NDDOT representatives also visited each reservation, provided documentation, discussed any issues, and then summarized the discussions on a consultation form that all signed. NDDOT then followed up according to the terms of the respective signed agreement (FHWA Resource Center 2008). During a decade of this type of project-to-project consultation, the foundation of a collaborative approach between NDDOT and the Tribes was built as heightened sensitivity and commitment to Tribal cultural and spiritual concerns were established through the development of personal and professional relationships between individuals from the agencies and the Tribes. This process was described from NDDOT's

perspective by retired NDDOT archaeologist, Kent Good, who launched the Tribal consultation effort for NDDOT, as follows:

> To say the least, it was a challenge . . . I had no manual, I had no book, I didn't know really what I was doing, other than that I love people. And I think my heart was in a good place . . . . I was really glad to find out that it's OK to be a feeling person and with Tribal people you wear it [your heart] on your head–it governs the way that you feel. So, I approached it from that point of view, with a heart and above all with respect. (FHWA Resource Center 2008)

The efforts of individuals—initially, Good's and those of the FHWA and Tribal representatives that he worked with—and their willingness to commit time and resources to build and sustain personal and professional relationships, were major contributions to creating a climate of mutual trust between the groups. Despite Good's retirement, and other personnel changes at NDDOT, FHWA, and in the Tribal offices, the spirit of the personal and professional relationships that were formed have remained, and the foundation of the mutual respect and trust that were built have persisted between them today. Good's replacement, NDDOT Tribal Liaison Jeani Bochert, has noted that "If you go in with a good heart, the [consultation] process will develop appropriately for all those involved. So 'best practices' is really having the 'heart' to consult." And her colleague, Mark Schrader at FHWA, has added, "Consultation is more than listening and seeing, it also involves feeling. In order to feel, you need to use your heart." NDDOT representatives continue to visit each reservation on a regular basis to build and sustain relationships and share information (FHWA Resource Center 2008).

By the early 2000s, once relationships between NDDOT and FHWA and Tribal representatives were firmly established, the necessity to formalize the consultation process further, according to the needs of the involved Tribes, became apparent. Working with the Tribes, NDDOT and FHWA developed a Programmatic Agreement (PA) document that identified and met Tribal expectations regarding cultural heritage issues. The PA also increased the likelihood that future Tribal consultation would lead to acceptable outcomes for all involved.

After several failed attempts to develop PAs with individual Tribes, the concept of developing one PA for a unified Tribal group was developed by the Tribes who felt that, with their varying expertise across Tribes, they were stronger and more effective when functioning together. This idea led to the formation of a Tribal Consultation Committee (TCC), composed of representatives from each consulting Tribe, NDDOT, and FHWA. The TCC meets twice a year to discuss projects and policy with regard to NHPA Section 106 compliance. In addition to the TCC meetings, NDDOT and FHWA also engage in onsite consultation for certain projects to help identify possible impacts and get first-hand knowledge of issues relating to cultural concerns, and to meet with the consulting Tribes individually at each TCC member's office at least once per year. Individual consultation with Tribes that did not become a party to the PA also continues.

Rather than going to the Tribes with preconceived notions and draft agreement documents in-hand, NDDOT approached the Tribes and asked what they envisioned being effective consultation. The PA that was produced in 2006, and then revised in 2014, dramatically altered the way NDDOT and FHWA consulted with the consulting Tribes. By taking a collaborative approach to consultation, time demands were reduced, mutually beneficial goals were supported, and more predictable outcomes were achieved (FHWA Resource Center 2008). As a living document, the PA builds on the past while looking towards the future. It respects Tribal sovereignty and the individual cultural identities of the consulting Tribes with an emphasis on collaboration and mutual respect. The PA provides a clearly defined approach to Tribal consultation that is honest and straightforward. In doing so, Tribal and non-Tribal people are afforded a unique opportunity to see each other in their own light.

The NHPA (54 U.S.C. 300101 et seq.) states that, in carrying out its responsibilities under Section 106 of the Act (54 U.S.C. 306108), a Federal agency shall consult with any Tribe or Native Hawaiian organization that attaches religious and cultural significance to properties described in subparagraph Section 101(d) (6) (B). The implementing regulations of Section 106 of the NHPA (36 CFR Part 800), requires consultation with Tribes for federally permitted or funded activities that have the potential to affect historic properties throughout the historic preservation review process. Federal agencies are required to consult with Tribes on a government-to-government basis, in a manner that is respectful of Tribal sovereignty. The regulations require Federal agencies to acknowledge the special expertise of Tribes in determining which historic places are of religious and cultural significance to them.

If NDDOT and FHWA's shared experiences with collaborative consultation working with the Tribes of North Dakota over the past 10-plus years are any indication, the processes involved in identifying and protecting submerged paleocultural landscapes and Tribal historic properties located on the OCS should be more culturally appropriate and effective if they are designed and conducted with active participation by engaged contemporary descendent Tribal communities. This approach should be particularly enhanced when shared Tribal concerns, interests, knowledge, traditions, and perspectives are all brought to the fore as important elements of each phase of the research that is performed as part of the NHPA Section 106-compliant identification process.

2.2 Collaborative Framework for the Submerged Paleolandscapes Project

One of the principal goals of the Submerged Paleocultural Landscape Project was to design and undertake research with direct involvement and contributions of ideas and information from URI-GSO's Tribal research partners, NITHPO, as well as that of Tribal scientists and Tribal historic preservation specialists from other federally and state-recognized Tribes in the region who share an interest in the project and its results. Because of its existing relationships with virtually all of these Tribes, NITHPO initially acted as the primary Tribal liaison for the project team. Research design development, fieldwork, data analysis, interpretation, and reporting completed by the project's team of non-Tribal and Tribal collaborative research partners led to new understandings about the benefits and challenges of how we communicate and work together, how we perceive submerged paleocultural landscapes, and how we think about and "do" the science that is focused on identifying Tribal historic properties in submerged environments. It also better defined and enhanced group and individual capacities for accomplishing this type of collaborative research.

Tribal engagement that occurred during the project principally consisted of:

- Collaboration in planning and participating in the 2013 Initial Project Workshop at the start of the Project. The Initial Workshop included academic, agency, Tribal, and industry attendees representing groups from a region extending from Maine to Delaware, as well as researchers from several nations outside of the United States (i.e., Denmark, the Netherlands, and the United Kingdom). The main purposes of the Initial Workshop were to begin a dialog among the represented groups about submerged paleocultural landscapes, to introduce the project's proposed goals, objectives, and methods, and to get feedback and guidance on them from workshop participants. An additional objective of the workshop was to begin developing best practices for the principal elements of the project (e.g., paleoenvironmental reconstruction, predictive modeling of site locations, integrating Tribal and/or non-Tribal oral histories into predictive models, identifying and reconstructing submerged paleocultural landscapes, submerged settlement site identification and excavation, and fostering open communication and developing common understandings).

- Completion of project-funded open water scuba instruction and scientific diver training obtained from URI's American Academy of Underwater Sciences (AAUS)-accredited Scientific Diver Program.

- Performance of annual marine archaeological field investigations requiring scientific diving, remote sensing, and sediment sampling in Greenwich Bay, off Cedar Tree Beach, in Warwick, Rhode Island (2012–2014), and in Block Island Sound, off West Beach, New Shoreham, Rhode Island (2015–2016).

- Presentations of annual project updates and NITHPO-produced project films to the United South and Eastern Tribes (USET) Culture and Heritage Committee at their national meetings (2013–2016).

- Participation in a mid-project (2015) Inter-Tribal Workshop at the Narragansett Indian Tribal Long House to update regional Tribes on the project's progress and to request comments and input on how best to ask for and integrate Tribal knowledge and oral histories into the project's predictive modeling process for identifying areas of the OCS with variable potentials for containing submerged Tribal sites.

- Participation in a BOEM- and Rhode Island Endeavor Program-supported offshore research cruise (2015) with the project's academic, Federal government, and Tribal scientists working together onboard URI's R/V *Endeavor* to gain first-hand experience collaborating and performing marine geoarchaeological field research (obtaining non-disturbance remote-sensing data and selective vibracore sediment samples) for the project on a large scientific research vessel in the offshore environment. A real-time digital audio-visual connection between the ship and shore-based members of the project team, interested Tribal members, and members of the public was provided and maintained by the URI-GSO's Inner Space Center, allowing a diverse segment of the public real-time access to project activities occurring at sea.

- Participation in a BOEM-, Northeast Regional Ocean Council- (NROC-), and Rhode Island Endeavor Program-supported offshore educational and capacity-building cruise (2016) on board URI's R/V *Endeavor,* proposed and organized by URI-GSO's project team with academic (local and international), Federal government and regional Tribal participants. The purpose of the cruise was to provide experience and training in marine geoarchaeological method and theory, technologies, and scientific practices, and to create opportunities for in-depth discussions and honest and open conversations about some of the difficulties and concerns associated with agencies, Tribes and academic researchers working together. Possible future directions for continuing and supporting collaborative and community-based Tribal ocean science and research were also discussed. Real-time digital audio-visual connectivity between the ship and shore-based members of the Project Team interested Tribal members and members of the public was provided and maintained by the URI-GSO's Inner Space Center.

- Participation in the preparation of Project Quarterly Progress Reports and annual Project Research Fieldwork Plans.

URI-GSO project staff took part in the above activities, and also:

- Extra-curricular attendance of powwows (Aroostook Band of Micmacs [Maine], Mashantucket Pequot Tribal Nation [Connecticut], Mashpee Wampanoag Tribe [Massachusetts], Narragansett Indian Tribe [Rhode Island], and Nipmuc Nation [Massachusetts]);

- Participation in the Federal ACHP's Office of Native American Affairs (ONAA) Native Youth Initiative event held at the Mohegan Tribal offices;

- Attendance of a URI Native American Students' Organization public outreach event [Rhode Island];

- Participation in informal meetings, conversations and sharing of traditional and non-traditional meals with Tribal members, Tribal Council members, and THPO staffs;

- Participation in sweat lodge, smudging, and sunrise prayer ceremonies;

- Visits to Tribal reserve lands to see, experience and hear stories about sacred and ceremonial places in the landscape; and

- Camping, kayaking, hiking, hunting, scuba diving, singing and praying with Tribal members and THPO staff.

These interactions presented unique experiences, situations, opportunities, and challenges, which collectively contributed to new sensitivities, perspectives, insights, and understandings about the agency, Tribal, and research communities. It also clarified for the project team and all who participated in the project the importance of the Tribal community's involvement in offshore research focused on identifying submerged paleocultural landscapes and Tribal historic properties.

The following best practices for agency, Tribal and research community engagement, and for including Tribal concerns, interests, knowledge, traditions, and perspectives in submerged paleocultural landscapes identification research, are intended to convey what has been learned from project-related experiences and to provide a point of departure for continued discussion and future additions and updates to best practices. Three primary areas of consideration emerged over the course of the project as being centrally important to the engagement of Tribal communities and the development of collaborative relationships among agencies, Tribes, and researchers: communication, relationship, and capacity building. Each of these topics is described below, their importance explained, and best practices associated with them are presented.

2.3 Key Areas for the Development of Positive Agency-Tribal-Researcher Interactions

2.3.1 Communication

Communication can be defined generally as the interaction between two people or groups of people during which information is delivered, received and understood. Many people assume that communication is a natural process that does not require explanation, but communication styles and expectations can vary significantly among cultures, groups, and individuals. Effective communication is the key to every aspect of research- and regulatory-related interactive processes. It is the cornerstone of all relationships and is critically important to help people build trust and respect for one another and resolve their differences. The importance of open, transparent, respectful, and regular communication among researchers, Tribes, and Federal and State agencies towards the process of identifying and protecting submerged paleocultural sites on the OCS cannot be overstated, particularly because, in the past, these groups have not typically had mutually beneficial relationships.

Consultation conducted as part of regulatory compliance requires multiple forms of communication among Tribes, agencies, researchers, and, in some cases, project proponents. The National Environmental Policy Act (NEPA), Section 106 of the NHPA, and the planning and leasing processes of Federal agency program activities provide opportunities for extensive communication among diverse groups for the purposes of identifying submerged paleocultural landscapes and National Register-eligible or listed historic properties in submerged environments. However, the nature and implications of these communications involve inherent complexities and legal constraints that may not be clear, even to those who are directly involved in them.

For the purposes of this discussion about best practices related to the communication among agencies, Tribes, and researchers, communication may be broadly considered as falling within one of two general categories: "collaborative communication" or "regulatory communication." *Collaborative* communication may be defined as the types of informal conversations and discussions that are normally engaged in by individuals or groups working together as partners for a common purpose. It is this type of communication that typically occurs, for example, between research partners collaborating on a study. In contrast, *regulatory* communication may be defined as the formal communication that occurs within a prescribed and consistent legal regulatory-compliance framework between different parties who are not necessarily working together for a common purpose. It is this latter type of communication that regularly occurs within the context of government-to-government "coordination," "cooperation," or "consultation," each of which describe substantively and legally different formats of regulatory communication and relationships between Federal agencies and federally recognized Tribes with local sovereignty/domestic dependent nation status.

Government-to-government *coordination* is defined in the Federal Land Management and Policy Act (43 C.F.R. 1610.3–Coordination with other Federal agencies, state and local governments, and Indian Tribes) as a form of regulatory communication that can be asserted by federally recognized Indian Tribes, as well as other Federal agencies, state and local governments, whenever a Federal agency is involved in land-use inventory, planning, or management activities. Input from coordinating agencies must be considered before impacts occur, and the Federal agency must work towards consistency between their plans and those of the coordinating agencies. Coordinating agencies must also be given prior notice of Federal agency activities, and Federal agencies must keep apprised of the coordinating agencies' management plans. All meetings between the Federal agency and coordinating agency must be public, and input from the coordinating agencies must be included in the Federal agency's impacts assessment studies.

In contrast, government-to-government *cooperation*, which is defined in the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 CFR 1501.6–Cooperating agencies), is a different form of regulatory communication/relationship. Cooperating agencies are any Federal agency that has jurisdiction by law, or is invited by a "lead Federal agency" to participate as a cooperating agency, because of the latter's special expertise with respect to a particular environmental issue. Any agency may request the lead Federal agency to designate it as a cooperating agency. Cooperating agencies participate in the NEPA process, preferably, at the earliest possible time. They also participate in the scoping process. Upon the request of the lead agency, cooperating agencies also take on the responsibility for developing information and preparing environmental analyses, including portions of the environmental impact statement, concerning those areas in which the cooperating agency has special expertise. In addition, they make available staff support at the lead agency's request to enhance the latter's interdisciplinary capability and normally use their own funds to do so. The lead agency shall, to the extent that available financial resources permit, fund those major activities, or analyses it requests from cooperating agencies.

Government-to-government c*onsultation* is defined in the "Secretary of Interior's Standards and Guidelines for Federal Agency Historic Preservation Programs Pursuant to the NHPA" as:

> . . . the process of seeking, discussing, and considering the views of others, and, where feasible, seeking agreement with them on how historic properties should be identified, considered and managed. Consultation is built upon the exchange of ideas, not simply providing information. (DOI-NPS 1983)

The FHWA and consulting Tribes working with them in North Dakota define consultation further with an emphasis on it being a collaborative process between agencies and Tribes working together as a group, "learning through education and interaction," in a way that requires us "to put our heart into it" and "to trust one another." "Tribal consultation must truly be consultation among sovereign nations" with the sovereignty of Tribes as nations within nations understood, and the importance of government-to-government relationships acknowledged and respected. "Tribal consultation goes far beyond merely complying with the law," and requires a genuine desire for Tribal input, which once obtained, must be acknowledged and acted upon (FHWA 2008).

Collaborative communication and regulatory communication, as they have been defined above, are very different; the latter emphasizes procedural fidelity over meaningful collaboration. Despite their differences, they are both conducted in one of two ways: in writing–through email or mailed written correspondence–or orally–by telephone or during in-person meetings.

During the project, it became clear that representatives from other Tribes in the project region were more comfortable, or at least more familiar, with the "consultation" form of communication. Consultation is associated with clearly defined expectations and outcomes, and it is this formal government-to-government framework that many Tribal representatives consider most appropriate, because it acknowledges the sovereign status of federally recognized Tribes. In contrast, the Submerged Paleocultural Landscapes Project was designed to provide an opportunity for non-regulatory collaborative relationships, between the project team (including NITHPO) and the region's Tribes, outside of any regulatory process, with the idea that an informal collaborative approach with a NITHPO Tribal liaison guiding the interactions would put Tribal representatives at ease and allow a freer exchange of ideas and information. Different groups often have different expectations of what constitutes appropriate communication. It is anticipated that with increased opportunities for collaborative communication and relationships, greater trust could grow among agencies, Tribes, and researchers, and all parties might become more skilled and comfortable with these exchanges.

Over the course of the project, the following best practices regarding collaborative communication among agencies, Tribes, and researchers were developed by the project team. These pertain to all participating groups, rather than just one particular group.

- Identify interested groups (agencies, Tribes, or research groups) based on the project or study area location, and then identify the people within each group with whom to communicate. Confirm their roles and authority to participate in the communication process, and maintain and distribute regularly an updated list of these peoples' contact information to the other groups within the collaborative partnership.

- Research the history of communication efforts among the groups involved with any project. If prior relationships have not been mutually satisfying, then identify the cause(s) of the difficulties and develop a plan to avoid exacerbating an existing problem and/or repeating previous mistakes.

- Research the preferred communication styles associated with participating groups and insure that all interactions are guided by this knowledge. It is the responsibility of each group to understand what their research partners consider to be respectful and engaged

communication. Conveying genuine care, respect, and understanding of the knowledge and perspectives that each individual or group brings to the research process is the basis for developing bonds of mutual trust and fostering positive collaboration. This approach is particularly important in situations where participating groups have had difficult relationships in the past.

- Establish clearly the type of communication that is desired and the purposes and expected format for it. For example, phone and/or in-person meetings may be the best and most effective form of communication for some Tribes. In the case of this project, the research team wanted to communicate informally with Tribes in a collaborative manner, rather than in a formal regulatory mode, since there was no project under review that would typically fall under a NEPA or NHPA Section 106 review process. This difference in understanding of the type and purpose of the desired form of communication, which was due, at least in part, to the Tribes being more used to interacting with agencies within the regulatory framework of NEPA or NHPA Section 106 compliance rather than as a partner on a research project, led to fundamental miscommunication among the project research team and some of the Tribes who had an interest in the project. Consequently, Tribal engagement in the project was less geographically broad than anticipated.

- Create a schedule at the initiation of any project-related interaction that is developed and agreed upon by all parties. Establish dates when representatives from agency, Tribal, and research groups will receive information, and for when they will need to provide a review of information, the type of capacity required to adequately perform the review, and when meetings and other forms of contact will be held.

- At the beginning of each project, develop a framework for addressing possible breakdowns of communication with participating groups. Establish what constitutes a breakdown of communication within the context of the project and provide a mutually agreed upon method for restoring positive communications.

- Avoid communicating with approaches that have proven unproductive in the past. Although this may seem obvious, communication styles are often so entrenched in the cultural fabric of a group, are accepted as standard operating procedure, or are so focused only on fulfilling legal requirements that additional, more effective, methods of communication are not considered or pursued. For example, if multiple written communications have not elicited a substantive and effective response, it is unlikely that continued efforts at written communication alone will be successful. Although continuing to communicate in a written format alone may meet a required legal standard of a “notice and comment” effort, the result is not likely to create the foundation for a constructive relationship. Review the preferred communication styles of the group being contacted and combine written communication with additional methods for reaching out to better ensure that effective two-way communication is established.

- Understand that agencies, Tribes, and research organizations all have limited resources for engaging in communication. All groups need to optimize and invest their available resources in communication attempts and be responsive to inquiries and requests for consultation.

- Take care to ensure that the meanings of the different vocabularies and concepts associated with each group are shared in a way that makes them mutually understandable, because meaningful communication is predicated on informed participants.

- Communicate orally and in-person through regular meetings, workshops, and project updates as often as possible or appropriate, to develop and sustain a committed relationship with the diverse individuals or groups. Many people prefer face-to-face oral communication over written communication in a collaborative relationship context.

- Provide opportunities for conducting confidential "closed door" discussions with Tribes to protect sensitive information about cultural sites, sacred sites, burials, hunting and fishing locations, etc. Federal agencies and researchers should request Tribes to advise them when sensitive information about such areas should be treated as confidential; however, even Tribal data and input not identified as such should initially be assumed as confidential, requiring Tribal permission before its use or release.

- Discuss and establish early in the collaborative process mutually agreed-upon protocols for handling different types of shared information to ensure their optimal protection. The collaborative partners should be particularly mindful of the limited protection offered under Section 304 of the NHPA, which provides an exemption from FOIA information requests, but only for information associated with National Register-eligible or listed properties, and only if the Keeper of the National Register (representing the Secretary of the Interior) agrees (DOI, 1995).

- Consult and communicate initially with Tribal leadership and the THPO. Seek input and advice from Tribal leadership regarding who the primary contact person or people will be and what leadership's preferences and practices are for engaging the Tribal community at-large at the start of collaborative engagement. Plan to follow-up with periodic updates on the collaborative work or project to keep Tribal leadership, the THPO, and the broader Tribal community informed of its progress and interim results, and to seek feedback and guidance on the direction and purpose of future research and how it may be applied to the Tribal community's current questions and problems.

2.3.2 Relationship

The term "relationship" describes the way in which two or more concepts, objects, or people are connected. In the case of agencies, Tribes, and researchers who are involved in managing submerged environments, establishing strong, mutually respectful relationships is a basis for culturally sensitive decision-making. The strongest and most long-lasting relationships in any situation are those in which all parties feel a genuine personal commitment to developing and maintaining the relationship and are not motivated strictly because of necessity or from a sense of responsibility. Even though relationships among the diverse groups involved with managing submerged environments generally occur in professional or work-related contexts, it is the emotional aspect of each individual's personal commitment that frequently controls his or her feelings about the other group and will ultimately define the nature of the relationship. Personal commitment requires investments of caring, time and effort on the part of the individuals involved, often in addition to and outside of typical work-related interactions and activities. When agencies, Tribes, and researchers work together to guide decision-making, the challenge is to develop a sustainable system for interaction that fosters and supports the development of long-term, personally committed relationships between the leadership and staff of each participating group.

The difficulties presented by this challenge are significantly amplified by the long history of colonialism, mutual distrust, cultural stereotyping, and racism, which must be acknowledged and accepted by all agencies, Tribes, and researchers who seek to develop contemporary collaborative relationships. Though a discussion of the basis for the difficulties in these relationships is beyond the scope of this document,

allowing historic distrust to dominate the relationship between groups or individuals is extremely damaging and counter-productive to any partnering effort. Agencies, Tribes, and researchers should identify those groups and individuals who are good candidates for collaborative relationships (e.g., those who have recognized the importance of, secured funding for, and have demonstrated their willingness to step forward to work together in a positive and mutually respectful manner) and those who are not. An additional challenge of developing sustained, long-term collaborative partnerships is the regular change through position advancement and the turnover of personnel that is an inherent element of the operations of each of these groups. Such changes in personnel can be a disincentive for involved individuals to want to invest the requisite care, time and effort necessary to form personally committed relationships with members of other groups. Relationships are developed among *people*, not among titles or roles.

The following best practices seek to address challenges associated with developing a sustainable long-term relationship between agencies, Tribes, and researchers and are intended to provide a framework for further discussion and updating:

- Understand that the relationships between regulatory agencies, Tribes, and academic researchers have been problematic in the past, and continue to be challenging in some situations. Acknowledging, understanding, and validating that these difficulties exist and isolating their causes in a non-judgmental manner is the first step towards developing more positive and sustained relationships for all involved.

- Avoid regarding individual groups as single homogeneous entities. Instead, recognize that agency, Tribal, and research groups are composed of sub-groups and individuals with varying backgrounds, priorities, capacities, histories, perspectives, commitment, internal cultures, and world views. Efforts to engage each group should acknowledge and respect this diversity and be customized to the needs and preferences of each group. Avoid a “one-size-fits-all” approach when consulting or collaborating.

- Acknowledge that mutually beneficial relationships between Tribes, agencies, and researchers must be based on the development of improved multicultural education and understanding between diverse groups.

- Explore the possibility of engaging individuals and/or organizations with training and experience in multicultural consensus building to assist with educational and relationship building activities between diverse groups.

- Avoid assuming that a history of problematic relationships should or will dictate the success of the current relationship. Identify individuals and groups who have shown a commitment to working collaboratively in a respectful, culturally sensitive manner, and maintain an open mindset about the outcome of relationships with those individuals/groups.

- Consider beginning any collaborative project involving agencies, Tribes, and researchers with a workshop-style meeting to discuss the positive and negative aspects of previous relationships, and to share openly the experiences and perceptions that participating groups have had with each other. The purpose of this initial workshop is to ensure that all participating individuals are provided with a neutral forum in which their concerns and suggestions are heard in a non-judgmental manner, and to identify barriers that may impact the development of positive relationships as the project moves forward. Including a skilled and experienced independent moderator who specializes in facilitating workshops with diverse groups is recommended.

- When developing relationships among groups regarding a specific project, contact should be made at the earliest stage of the project, before project proponents or associated groups have expended significant resources. Initial contact should be made *in person,* at a mutually agreeable location. At the initial meeting, the following should be provided:

    1. The type of contact and information that is being requested (i.e., collaboration, consultation, etc.).
    2. The type of project and a description of the proposed work, a map of where the work may occur, how the work will impact the landscape, and a thorough description of any cultural sites that have been located in the area.
    3. Discussion of Tribal perspectives and cultural significance regarding the geographic area to be impacted.
    4. Discussion of Tribal preferences regarding the style, frequency, and outcome of the contact and/or communication.
    5. A proposed project schedule, including deadlines for review of information.
    6. A discussion of expectations of all participating parties, including effective and respectful communication methods.
    7. Explanation of the types of data that will be collected, and the requirements (computer hardware and software, technical expertise, etc.) that will be necessary to effectively review the data.
    8. Discussion of the capacity of each group for data review and collaboration, and methods for improving capacity if necessary.
    9. Ample time to discuss each group's concerns and outlooks regarding the project.

- Identify the people or positions within each group who will be participating in the collaborative project, and confirm their roles, authority, ability, and interest in committing to participating in the development and maintenance of long-term relationships.

- Develop a Memorandum of Understanding (MOU)* collaboratively with equal input from all groups that defines the specific nature of the relationship. The MOU should describe in broad terms the guiding ethos and concept of mutual understanding, purpose, goals, and plans that are shared and will be committed to by the involved groups and individuals comprising the partnership. The MOU should also include basic performance requirements for engagement, and for open, respectful and effective communication, long-term relationship development and maintenance, and capacity building. Expectations of what constitutes participation, as well as minimum anticipated requirements for staff and facilities, approximate time requirements for involvement, and recommended protocols for conflict resolution should also be included (**MOUs tend to be used for simple common-cause agreements, which are not legally binding*).

- Recognize the primacy of Tribal homelands for Native peoples, and the complex epistemologies and traditional practices some Tribal people have regarding the earth, human and non-human relations, animate and inanimate places, features, and objects, past, present and future. Non-Tribal agency personnel and researchers may benefit from cultural education about Tribal beliefs, perspectives, and practices that would provide a better understanding the priorities and world views of Tribal peoples.

- Ensure that Tribal protocols and proper communication channels are respected when engaging the research team's Tribal research partners. At the request of the established Tribal contact, include Tribal elders and Tribal youth as integral and equal members of the research team. Involve them to the fullest extent possible in all phases of the research project, from the development of

research goals and designs, to the planning and execution of the fieldwork, and in the analysis, interpretation, and communication of the research's results.

- Avoid regarding Tribal personnel as simply agency regulators, project reviewers, consultants, or information sources. Instead, view Tribal personnel as potentially engaged research partners who may want to be involved in all aspects of the decision-making and execution of project research, so that Tribal questions, concerns, ethics and processes are integral to the research, while familiarizing themselves with scientific theories, methods, and results of the research being conducted.

- Commit to developing interpersonal relationships with individuals in participating groups outside of the work environment when appropriate. Interacting one-on-one or in small groups in casual situations provides an opportunity for the foundation for care, trust and understanding between individuals and groups to develop, and can be a powerful way to address and eliminate stereotypes and prevent conflicts.

2.3.3 Capacity Building

Building capacity for agencies, Tribes, and researchers to work together effectively in either collaborative or regulatory situations is necessary for putting best practices into action. Simply being presented with an opportunity to collaborate or consult is often not enough. Groups that have adequate staff (with the necessary interest, experience, knowledge, training, and skills), facilities and infrastructure, and sustainable sources of funding will be most able to implement best practices and be optimally positioned to take advantage of opportunities to collaborate or consult. Simply providing an "opportunity" to engage, participate or comment to individuals or groups who do not have the necessary capacity to do so is not likely to result in a successful outcome.

A genuine desire to improve capacity, and an understanding of the potential benefits that can result from improved capacity, must come from within each individual or group. Capacity cannot simply be bestowed by an outside entity upon those who do not seek it, or who do not see its benefit. Similarly, groups seeking to increase their capacity should not rely solely on outside entities to provide such opportunities, guidance, and funding. Building true capacity involves self-examination, visioning, planning, commitment, significant and sustained effort, and usually some type of financial support. It also places new burdens of responsibility upon those who have achieved greater capacity to be actively engaged and responsive partners. The newly developed role of an active partner requires, ironically, even more capacity to maintain. Some groups and individuals choose to focus on resolving more immediate, internal issues, and do not feel able to dedicate the time and energy necessary to building their capacity to partner with outside entities. Other groups are not yet ready to conduct the type of internal self-examination that is necessary to identify whether any of their own assumptions and/or actions regarding interactions with outside entities have contributed to decreased capacity, and whether those assumptions and actions can be changed. In some circumstances, individuals within groups may have a genuine desire to improve their capacity for positive relationships, but are hindered by the existing political, cultural, or organizational structures of their group. These needs must be respected and addressed in any way possible. However, it is crucial for groups that lack capacity to understand that, unfortunately, decisions affecting them may continue to be made without their input until they are able to become effective collaborative partners.

During the project, it became clear that there are significant challenges in the abilities of agency historic preservation personnel, academic researchers, and Tribes to collaborate and consult in an effective manner. The capacity of each group varied, but consistently appeared to be non-optimal relative to meeting the complex challenges they each faced in their respective roles in the management of submerged

environments and relative involvement in submerged paleocultural landscapes identification research. Observed and reported capacity deficit areas include:

- Staffing, including issues with insufficient staff, senior staff without sufficiently experienced and knowledgeable junior staff to replace them, and staff turnover and advancement that interfere with the stability of collaborative relationships.

- Infrastructure, including up-to-date computer equipment and software, and associated technical capabilities of staff using these technologies.

- Cultural awareness, including knowledge of what constitutes effective and respectful oral and written communications, including the importance and function of in-person meetings and the timely review and comment on Federal agency activities, including proposed rules and public notices published in the Federal Register and technical documents submitted for NEPA and NHPA Section 106 compliance.

- Technical expertise or experience in marine geoarchaeology and related scientific disciplines.

- Knowledge, experience, and understanding of Tribal cultural preservation and research priorities, perspectives, and concerns regarding resource and data management strategies, and scientific research approaches.

- Knowledge, experience, and understanding of the scientific method and the concept of "uncertainty" in state-of-the art science, and the ways that research is conducted, communicated, and funded.

- Knowledge, experience, and understanding of the missions, goals, responsibilities, and capacity of agencies.

- Variations in the genuine desire for, and ability to maintain, mutually successful collaborative relationships, as well as the goals of those relationships.

- Governmental, regional, research community, and inter- and intra-Tribal politics, which profoundly impact the capacity of diverse groups to establish mutually beneficial relationships.

- Varying perceptions regarding the rights, legality, and legitimacy of other groups to be in management and decision-making roles.

- Sustainable sources of funding. Without sustainable funding very few of the proposed best practices will ever be implemented. In fact, it can be argued that the absence of sustainable funding is the primary underlying cause of many of the observed capacity deficits. Identification of the funding sources necessary to implement/adopt the proposed best practices is a prerequisite to future progress.

- Varying abilities and desire of diverse groups to move beyond a problematic history of stereotyping and difficult relationships, and view each new situation as an opportunity to move forward in a positive manner that is mutually beneficial for all involved.

The following best practices are intended to provide a foundation for addressing the observed and reported capacity deficit areas that presently exist within agencies, Tribes, and research groups:

- Hire additional staff as needed to address increased project review case load and enhance capacity for collaborative relationship building and regulatory project review.

- Identify a staff member who wants to, and is qualified to serve as the group's lead for developing and maintaining increased capacity for engaging in collaborative relationships with other groups. This individual should have demonstrated prior experience, success, and a genuine commitment to facilitating collaboration with diverse groups.

- Obtain, maintain, and train staff in the use of computer equipment, software, and internet services to increase technical capacity to engage in digital data processing, review, and analysis, and online interactive communications. This recommendation is not necessarily associated with large financial expenditures. Though costly and sophisticated computer workstations may be required for processing and analyzing complex geologic, geophysical, and archaeological datasets, widely available inexpensive computer systems and basic software can often meet the needs of many different groups to review digital information and collaborate effectively. In addition, a wide variety of free or inexpensive self-paced training courses are available online for many commonly used computer programs.

- Conduct regular in-person meetings to provide enhanced capacity for relationship building, the development of greater cultural awareness, and instruction on effective, respectful oral and written communications. Include discussion about the streamlining of technical reporting content to enhance the capacity for agencies and Tribes to conduct reviews and provide comments in a timely manner, and about strategizing techniques that increase the Tribes' capacity to review and comment on agency regulations, proposed rules and public notices published in the Federal Register.

- Enhance the capacities of agency and Tribal staff for better understanding of the reasons, techniques, types of information produced, impacts from, and the limitations of "Western" scientific approaches. Provide researcher-led workshops and onshore and at-sea experiential learning opportunities to expand technical expertise and give hands-on experience and training in marine geoarchaeological data acquisition and interpretation. Related scientific methods and theory, including a thorough explanation of the interpretive steps and uncertainties/resolution limits involved when presenting findings, should also be presented and discussed.

- Develop and implement a mandatory, cultural sensitivity training program for all individuals involved in collaborative relationships. This training program should be created by Tribal and non-Tribal people, and include education about the world view, professional and personal responsibilities, goals, and concerns associated with each group that is participating in a collaborative relationship.

- Develop and implement a formal mechanism to provide college-level education in earth and ocean sciences, anthropology (with archaeology, cultural anthropology and/or ethnography, linguistics foci), marine affairs, marine spatial planning, and/or maritime policy to interested and qualified Tribal people of all ages. Incorporate the following concepts into any education program:

    1. Simply providing the "opportunity" for prospective students of any age to attend college or participate in scientific research may not be adequate to ensure student success or development of meaningful capacity. Earning an undergraduate degree requires mastering a

challenging balance between classwork and a rigorous schedule of lectures, labs, field work, internships, and independent study projects. Becoming an academically qualified professional with decision-making responsibilities frequently requires significant additional time, commitment, and financial resources to obtain a graduate degree. Students from all cultures and backgrounds struggle with inadequate academic preparation for college-level courses, financial stresses that require them to work a significant number of hours during the school year, conflicting school and family responsibilities, inadequate understanding of the amount of time required to complete class assignments and master new material, undeveloped time management skills, and unrealistic expectations about their ability to successfully balance multiple demands and expectations. Programs that identify these challenges and work directly with each student to address them will provide the longest lasting improvement of capacity.

2. The scientific method provides only one way for describing and understanding the natural world and the relationship that humans share with it and is perceived and understood differently by Tribal cultures, as well as agency and academic researchers. People who seek educations in academic institutions may be exposed to curricula that include information presented as “scientific facts,” which differ substantially from what they have learned from their traditional and religious teachings and personal experiences. Integrating Western academic knowledge and traditional knowledge can create situations of intellectual and spiritual dissonance (described by others as the nearly impossible challenge of "standing in two canoes"). Resolving these conflicts on a personal level requires students to examine the complexities of their developing personal goals, values and beliefs, which adds a significant cognitive and emotional burden to the challenges of earning a college degree. Educational programs that seek to build capacity must be sensitive to these challenges, and welcome non-Western knowledge and perspectives regarding humanity's relationship to the earth as an opportunity to complement and broaden the scientific perspective.

3. One-on-one mentoring has been shown to be extremely successful in ensuring student success in a variety of situations. Any educational program that seeks to build capacity in highly technical fields should provide incoming freshman with a senior undergraduate or graduate student mentor who has demonstrated interest in ability for developing relationships with new students and assisting them at least throughout their freshman year. Faculty, staff, and other professionals serving as mentors and networking contacts can be invaluable resources but must be willing to be a consistent presence throughout the students' undergraduate academic careers.

- Provide Tribal-led workshops and experiential learning and/or training opportunities for Tribal and non-Tribal researchers and agency staff to gain knowledge, experience and understanding of Tribal cultural and preservation priorities, and related perspectives and concerns to facilitate, guide and enhance the capacity for developing new ways of blending Tribal approaches with agency-led management and scientific research practices.

- Provide agency-led workshops for non-Tribal researchers and Tribal members on the missions, goals, and legal responsibilities of regulatory agencies to enhance the capacity of these groups to better understand the role of Federal agencies in collaborative and regulatory relationships.

- Conduct workshops focused on enhancing capacity to develop sources of sustainable funding to directly support capacity building and the establishment and maintenance of collaborative relationships between agencies, researchers and Tribes.

- Develop a Tribal ocean research consortium comprised of multiple Tribal communities united in their desire to build capacity to become active Tribal participants in the ocean sciences, and to engage Federal and state agencies, universities and other research groups in seeking funding opportunities.

- Enhance capacity for funded collaborative relationships between agencies, researchers, and Tribes by gaining membership to one of the 17 Cooperative Ecosystem Studies Units (CESUs) that are distributed throughout the US. CESUs are composed of Federal agencies, a host university and partner institutions, such as Tribes, state local government agencies, non-governmental and nonprofit conservation organizations, and other non-Federal entities, and provide research, technical assistance, and education to Federal land management, environmental and research agencies and their partners. Partners are collectively multi-disciplinary and serve the biological, physical, social, cultural and engineering disciplines as needed to address natural and cultural resource management issues at multiple scales and in an ecosystem context. As partner members, Federal agencies, research institutions, and Tribes could engage in funded collaborative projects through CESU agreements.

- Explore funding opportunities with the Bureau of Indian Affairs (BIA). The Indian Self-Determination and Education Assistance Act of 1975 (Public Law 93-638) authorized the Secretary of the Interior, the Secretary of Health, Education and Welfare, and other government agencies to enter into contracts with, and make grants directly to, federally recognized Indian Tribes to help them participate in planning and administering Federal services, programs, and activities. BIA Section 638 contracts or grants could be pursued to fund Tribal science educational programming through the Tribes' administrative offices or the office of their Educational Director.

- Explore funding opportunities with the DOI NPS's State, Tribal, and Local Plans & Grants (STLPG) division that oversees the Historic Preservation Fund (HPF). Established by Congress in 1976 for the exclusive use of historic preservation activities and to support implementation of the NHPA of 1966 (including Section 106), the HPF is funded through annual OCS leasing revenue, which since 1980 has provided an annual revenue stream of $150 million to the HPF. Congressional annual appropriations of the HPF, however, typically only amount to about one-third of the fund's annual revenue. The HPF provides grants to state and Tribal historic preservation offices to pay for such things as surveys of historic resources, training, nominations to the National Register of Historic Places, and grants to local jurisdictions. The HPF also funds Tribal Historic Preservation Office Grants and Tribal Heritage Grants. Other funding opportunities exist for addressing the reported capacity deficit areas that include several Federal agencies as well as private funding sources that include foundations and NGOs.

- Explore funding opportunities for summer internship programs allowing Tribal students to work (paid) with mentors at relevant science centers, regulatory agencies, etc. If developed correctly, internships could provide invaluable experience for the student and the host agency or center.

- Engage Tribal nonprofit organizations that advocate on behalf of multiple Tribes (e.g., USET) as a resource for identifying and obtaining funding to build capacity for multiple Tribes.

3.0 Best Practices for Assessing Paleocultural Sensitivity and Identifying Submerged Paleocultural Sites on the OCS

An effective and accurate assessment of "paleocultural sensitivity," or the likelihood for paleocultural sites to be present within a given area and the ability to identify these sites in submerged environments, requires a complex combination of archaeological, geological, and geophysical analyses, as well as significant sensitivity and knowledge regarding the cultural beliefs, practices, and histories of ancestral and contemporary Tribal peoples. Best practices regarding respectful and collaborative engagement of Tribal communities that apply to all aspects of the paleocultural sensitivity assessment and cultural site identification process have been presented in Section 2.0 of this document. Section 3.0 focuses on clarifying and standardizing an organized approach for:

1. The scientific analyses that are required to understand the extent to which paleolandforms have been preserved in submerged environments;

2. Understanding the geologic, climatic and environmental conditions that characterize preserved submerged landscapes, and;

3. Understanding the extent to which Tribal peoples may have interacted with these preserved paleocultural landscapes as identified through archaeological research, Tribal engagement, and sharing of knowledge about the past.

The best practices that follow first clarify terminology commonly used in the paleocultural sensitivity assessment and cultural site identification processes (Section 3.1), and then present a suggested framework for the various geological, geophysical, environmental, and archaeological analyses that are necessary to adequately characterize a study area and identify cultural sites within it (Section 3.2). Sections 3.3–3.7 provide additional, specialized best practices for each of the steps outlined in the general framework presented in Section 3.2.

3.1 Clarification of Key Terminology

Clarifying commonly used terminology is of primary importance to developing a broadly applicable paleocultural sensitivity assessment process for submerged environments. This may seem like an obvious matter of semantics, but it is important that the vocabulary associated with the paleocultural sensitivity assessment process is standardized and clearly understood by the diverse audiences who may need to review, interpret, or use the research results to make management decisions. Unfortunately, some of the most common terms used by researchers and agencies about submerged cultural sensitivity assessments and identification surveys have multiple meanings that can create significant confusion between research partners from diverse backgrounds. For example, BOEM's Arch GL document (DOI-BOEM 2015a) is intended to provide a framework for historic property identification surveys and to provide guidance for the types of analyses that are necessary for a thorough assessment of a study area's likelihood of retaining archaeological sites. BOEM guidelines stipulate the creation and discussion of a "paleolandscape reconstruction" that:

> ... presents and illustrates the analysis and identification of areas of high potential for the presence of pre-contact archaeological sites. The paleolandscape reconstruction should be based on an approach that synthesizes the sea-level history and terrestrial site patterning gathered in the Cultural and Environmental Context [section of the report], with the acoustic remote-sensing and direct sampling data gathered during the survey. This information should be developed into a model that delineates the archaeological potential of the formerly subaerial landscape within the survey area. (DOI-BOEM 2015a:13)

In this context, the term "paleolandscape reconstruction" is used in a way that includes "paleocultural sensitivity assessment" as part of its process and resulting data output. Both terms represent the analyses and syntheses of several types of complex geophysical processes, geologic structures, archaeological data and ethnographic information. This information typically includes geologic evidence-based reconstructions of paleoshoreline locations, identification of relict terrestrial geomorphic features interpreted from available sidescan imagery, subbottom profiles, swath bathymetry, and sediment coring data, assessment of the potential for and actual preservation of relict paleolandforms, paleoenvironmental analyses from sediment core samples, and the assessment of the cultural sensitivity based on the application of locally and/or regionally available archaeological data, and ethnographic information shared by Tribes to identify preserved relict terrestrial landforms located within a study area.

Despite the interrelationship between these terms, "paleolandscape reconstruction," "paleoenvironmental reconstruction," and "paleocultural sensitivity assessment," should not be used interchangeably because they represent different concepts to individuals in diverse groups. For example, in geological disciplines, the term "paleolandscape reconstruction" frequently represents a reconstruction of paleo-topography and paleoenvironments only, with no consideration of the cultural uses or cultural importance of those landscapes. In contrast, in disciplines like anthropology or archaeology that focus on understanding human interactions with the natural environment, "paleolandscape reconstruction" may be used to represent a much broader concept that includes the geological and paleoenvironmental elements of a geographic location, as well as their paleocultural uses and attributes.

Another example of the potential confusion caused by commonly used words is the term "model," which has multiple definitions and uses. A "model" can describe a qualitative interpretative visual representation of a predicted variable, or it can also represent the results of a complex multivariate analytical process (frequently defined by statistical or mathematical parameters) that is designed to simulate or predict outcomes. The following best practices were developed to assist with defining and standardizing the lexicon that is most frequently applied to assessing the cultural sensitivity of previously terrestrial landscapes that are now submerged.

3.1.1 General Considerations

- Request that key terminology be clearly defined in all communications and in all technical and project reports, to avoid potential misinterpretation by collaborative research partners from diverse backgrounds. Avoid assuming that frequently used terminology is widely and/or accurately understood in the same way across all the different groups of people who are engaged in the research process.

- Clearly present the degree of uncertainty, scale, and resolution of the findings in interpreted data.

- Avoid using terms such as "paleolandscape reconstruction," "model," or "paleocultural landscape reconstruction" as generic or interchangeable descriptions for the multiple types of analyses that are required as part of a paleocultural sensitivity assessment and identification survey. Instead, differentiate between each type of analysis that is necessary for a comprehensive paleocultural sensitivity assessments and identification survey using clearly defined, unambiguous terminology that is broadly understandable to individuals and groups from diverse backgrounds.

- Avoid using the term "model" unless its meaning is clearly defined in the context of a specific discussion. For example, a map illustrating geographic areas of varied predicted cultural sensitivity is not necessarily a "model," unless the processes used to create it are

clearly described, reproducible, and testable. Similarly, a sensitivity map should not be called a "model" simply because it was created using computer software.

- Be cautious about using the term "site." In some disciplines, this term simply represents a particular geographic study area; however, in archaeology, the term "site" has a specific meaning, that an archaeological deposit (or deposits) exists in a given area.

3.1.2 Standardizing Key Terminology

- Develop and distribute a standardized, interdisciplinary lexicon as part of a generalized methodology for the paleocultural sensitivity assessment and cultural site identification processes that can be used regardless of the geographic region being studied, and include it in future archaeological guidance documents. The lexicon provided on pages iii through iv of this document provides a possible example.

- Consider adopting these definitions for key terminology associated with the study area characterization process:

    1. Archaeological Site: *A geographic area where physical remains (i.e., features and artifacts) correlating to past human activity are present.*

    2. Model: In general, *a process, object, map of two or three dimensions, or illustration that helps to visualize or predict something.* This term has multiple meanings and implications, and should be defined clearly each time it is used. See Section 3.7.1 of this document for detailed discussion of the use of the term model in the context of paleocultural sensitivity assessments.

    3. Paleotopography: *Old or ancient topography*, describing the physical configuration of the old or ancient land surface, frequently with respect to elevation. For example, Western Maine is characterized by mountainous topography, whereas most of Rhode Island has low-lying topography. Note that this term refers to the natural environment only, without any implication about the cultural use or importance of a geographic area.

    4. Paleoenvironment: *Old or ancient environment,* describing the ecological and climatic characteristics of the paleo-land surface, such as an area characterized by lakes and rivers, and vegetation indicative of a cold climate. Note that this term refers to the natural environment only, without any implication regarding the cultural use or importance of the environment.

    5. Paleolandscape: *The combination of the paleotopography and paleoenvironment of a geographic area*. Using the term "paleolandscape" should imply a comprehensive understanding of the natural environment in a geographic area. Note that this term refers only to the physical characteristics of an area, not to the cultural use or importance of the area.

    6. Paleocultural Landscape: *An old or ancient landscape that was inhabited or modified by humans, and/or a landscape that is perceived by contemporary Tribal communities as having cultural importance to them since ancient times.*

7. Paleocultural Sensitivity: *The potential for paleocultural sites to be present within a given geographic area.*

8. Paleocultural Sensitivity Assessment: *An assessment in which cultural and environmental variables are examined to determine the potential for paleocultural sites to be present within a given geographic area.*

9. Paleocultural Site: *A site with evidence of old or ancient cultural activity or importance.*

10. Paleocultural Site Identification Survey: *A geoarchaeological survey done to identify paleocultural sites within a given geographic area.*

11. Study, Survey or Project Area: *The geographic location that is being investigated*, and where activities such as geophysical surveying or archaeological identification or investigation activities take place. The general term "study area" is used throughout this document, because of its broader applicability to multicultural perspectives and different types of investigations.

12. Tribal Knowledge, Traditional [Ecological] Knowledge: *A cumulative body of knowledge, practice, and belief, evolving by adaptive processes and handed down through generations by cultural transmission.* It concerns the relationship of living beings (including humans) with one another and with their environment (Ball et al., 2015).

3.2 Summary of a Recommended Study Area Characterization Process

Assessing the potential paleocultural sensitivity of a study area requires an interdisciplinary approach involving a variety of complex geophysical, geological, archaeological, and ethnographical investigative processes. All analyses done in these investigations should be conducted sequentially, so that each step informs and directs subsequent steps in the process. Although variations in project goals, data availability, and the geological and archaeological history of different geographic regions makes the development of a specific one-size-fits-all methodology problematic and not particularly useful, the following best practices provide a suggested framework for study area characterization that is broadly applicable to investigations in submerged environments. More detailed best practices pertaining to each of these steps are discussed in sections 3.3–3.7 of this document.

1. Conduct a thorough Desktop Study to synthesize and assess previously collected data in the study area. The Desktop Study should be viewed as the first step in the study area characterization (see Section 3.3 for associated best practices), and should not be regarded as optional.

2. Use exiting relative sea level change curves (preferably based on data specific to the geographic area being studied) and the highest resolution bathymetric datasets available to create preliminary reconstructions of approximate paleoshoreline position(s) in the time period(s) of interest. Bathymetric datasets for US waters are publically available online through the NOAA Bathymetric Data Viewer. The purpose of this step is to identify and illustrate which portions of the study area were likely to have ever been exposed and therefore available for habitation by Tribal peoples, rather than to identify precisely the locations of paleoshorelines (see Section 3.4 for associated best practices).

3. Create digital 2D or 3D reconstructions of the paleotopography for the time period of interest in geographic areas identified as subaerially exposed in step #2. Combine existing swath bathymetry

(i.e., multibeam and/or interferometric) sidescan, subbottom, and sediment core information compiled in the Desktop Study (if any is available) with newly acquired geophysical and geotechnical project data (see Section 3.5.2 for recommended data acquisition protocols) to identify what geologic features (paleoshorelines, channels, uplands, marshes, etc.) appear to have survived inundation and are still present (see Section 3.5 for associated best practices, particularly Section 3.5.3 for cautionary best practices pertaining to digital reconstructions).

4. Assess the extent to which paleotopographic features have been modified (i.e., eroded, transported, compacted, etc.) by impacts from marine transgression and submergence resulting from post-glacial sea level rise and identify areas (if any) where relict paleolandscapes appear to be preserved (see Section 3.5 for associated best practices).

5. Obtain sediment cores in areas that appear to represent preserved relict paleolandscapes to verify interpretations of the geophysical data (see Section 3.6 for associated best practices).

6. If preserved paleolandscapes are identified based on the above steps, prepare a paleoenvironmental reconstruction of the area (using swath bathymetry, subbottom profiler and sediment coring data) (see Section 3.6 for associated best practices).

7. If acquired and interpreted data demonstrate the presence of a relict, preserved paleolandforms, assess the paleocultural sensitivity of the represented landforms based on results from engagement and dialog with Tribal research partners, and from a review of the results of local and regional archaeological investigations of analogous landforms onshore (see Section 3.7 for associated best practices).

3.3 Conducting a Comprehensive Desktop Study: Compiling Data and Understanding the Current State of Knowledge in the Study Area

The term “desktop study” refers to the compilation, synthesis and summary of pre-existing, publicly available geophysical, geotechnical, archaeological, and cultural data and information about a given study area at the time when the investigation is initiated. Performance of a desktop study does *not* involve acquiring new field survey data. Often, archaeological guidance indicates that results of desktop studies should be included in archaeological resource assessment reports, but it does not provide specific guidance about the importance of conducting desktop studies before initiating a field survey, the specific content of desktop studies, or how desktop research should inform field survey design or data interpretation. The importance of desktop studies should be stated and their contents should be standardized, within agency guidelines, if available, to provide clear standards for all study area characterizations. This section provides best practices that will assist with conveying the importance and recommended content of pre-survey desktop studies.

3.3.1 Understanding the Importance of a Comprehensive Desktop Study

- Regard a thorough desktop study, consisting of the topic areas outlined in Section 3.3.2 of this report, as the critical first step of any study area characterization process. Geologic, geophysical, archaeological and cultural data and information compiled in the desktop study should be regarded as the foundation for planning additional data acquisition, interpreting survey data accurately, maximizing project resources, communicating with Tribes, other agencies, and stakeholders, and informing a sound decision-making process during subsequent phases of the project.

- Recognize that comprehensive desktop study maximizes project resources. Desktop studies eliminate re-acquisition of data that already exists, identify potential data acquisition and processing problems, and allow project resources to be target at filling data gaps. Understanding Tribal concerns and the history of the agency-Tribe-academic relationship with respect to a given study area provides important information that may also affect field surveying protocols, and assists with developing communications and research strategies that are culturally respectful and more effective between the different groups of research partners that are involved (e.g., agencies, Tribes, and researchers).

- Plan study area characterization projects so that adequate time and resources are allocated for the completion of a thorough desktop study. Maximize usage of digital oceanographic data that is publicly available online (e.g., NOAA Bathymetric Data Viewer, USGS Open-File Reports, state geographic information systems [GIS] clearing houses), which will reduce the time required to compile existing scientific information for a project site. Also review archaeological and cultural information that is available through engagement and communication with Tribal research partners, and through archaeological reports and site maps on file at BOEM and other Federal agencies, State Historic Preservation Offices (SHPOs), Tribal Historic Preservation Offices (THPOs), and Offices of the State Archaeologist, or complimentary state departments of historical and/or cultural resources.

- Acknowledge that a thorough desktop study involves acquiring data that are multi-disciplinary and multicultural in scope. Tribal knowledge is complimentary and equally important as a source of data as that is generated by scientific research, and is necessary for developing a shared understanding and/or common knowledge base.

- Consider updating the current BOEM Arch GL to include a discussion about the necessity for, and content of, desktop studies that are specific and clear. Present this discussion in the document prior to sections relating to the acquisition of new geophysical, geologic, archaeological, or ethnographic information.

3.3.2 Recommended Content of a Desktop Study

Preparing a desktop study requires the compilation and assessment of the types, quantities, formats, and quality of pre-existing data available for the study area. The following sub-sections define recommended subject matter that should be included in desktop studies, and provide best practices related to each subject.

3.3.2.1 Identification of the geographic and temporal limits of the study area

- Define the geographic location, and the horizontal and vertical boundaries of the study area, including the maximum sub-seafloor sediment depth of interest. A precise definition of the study area boundaries is necessary to target the focus of a desktop study, and to assess whether pre-existing data is applicable to the study area's horizontal extent and vertical depth of interest.

- Develop a geospatial database of the study area boundaries (using ArcGIS or other geospatial software) that will be used for compiling all project geospatial data. Developing a geospatial representation of the study area allows pre-existing data that is already available in a geospatial format to be uploaded and compared to the defined project area to determine whether the available data is applicable.

- Define the time period for which cultural site potential is being assessed. Studies focused on assessing paleocultural sensitivity necessitate desktop studies that synthesize available geologic and geophysical data, archaeological data, and ethnographic information shared by Tribal research partners.

3.3.2.2 Engagement and dialog with Tribal communities

- Identify Tribal communities who have cultural connections to the study area with whom collaborative engagement, dialog and relationships will be developed or continued throughout the course of the study.

- Research previous agency-Tribal relationships (if any) pertaining to the study area to evaluate the nature of these relationships, and develop a plan for appropriate, culturally sensitive engagement.

- Engage Tribal representatives in dialog to discuss the study, to understand specific Tribal concerns and priorities associated with the study area, and to develop a collaborative plan for the project that will incorporate Tribal suggestions, concerns, and priorities.

3.3.2.3 Assessment and summary of pre-existing scientific data

A desktop study should synthesize pre-existing information to provide a preliminary characterization of the study area, and to identify additional data that is necessary to achieve project goals. The following best practices assist with conducting an effective data compilation effort:

- Identify the research groups in state and Federal agencies, industry, and academic settings that specialize in studies of the geological, archaeological, and cultural histories of the project area, and include these individuals and/or groups as members of the project team. Targeting expertise within the agency, academic and applied research communities can maximize project resources by obtaining access to syntheses of previously collected and interpreted data that can assist with an efficient preliminary characterization of the project site, and aids in the accurate interpretation of new data.

- Examine available online databases, analog and digital geologic and geophysical data in the scientific literature and curated by state and Federal agencies, as well as archaeological site information and historical reports pertinent to the study area and assess the availability of traditional cultural knowledge and input from contemporary Tribal communities, and local informants. Assess the types, amounts, quality and usefulness of pre-existing data by answering the following questions for each dataset or data type:

    1. Are the data publicly available and readily accessible? Can they be shared, or are they considered to be proprietary? The usefulness of data held privately by individuals and organizations should be weighed against the amount of project resources required to access and/or use the data.

    2. Are the data in digital or analog format? Digital, geospatially referenced data requires the least project resources to review and incorporate within project databases when compared with analog data; however, avoid assuming that “old” or analog data are not useful. If analog data fills critical data gaps for the project area, then assess their resolution (see item #4 below) and quantify the resources necessary to digitize the data.

3. What is the positional accuracy of the data? Data acquired with older equipment may not provide precise characterization of specific locations within the study area but may contribute to a general characterization of the area.

4. Are the data presented at a scale and of high enough resolution to contribute to a characterization of the geographic and temporal extent of the project site? For example, subbottom data that do not clearly resolve acoustic reflectors, or that are lacking in resolution at depths associated with the temporal target of the project, may be of limited usefulness.

5. Have any cultural resources assessments or identification investigations been conducted within or in proximity to the study area previously? What are the geographical limits of those previous investigations? What kind of research and/or survey methods were employed during those investigations? Were any cultural sites (i.e., archaeological deposits or culturally sensitive areas for Tribal communities) identified within or in proximity to the study area, and what were the types and ages of the sites that were identified?

- Summarize compiled data with a table that includes the following information, and include the table as background material for site characterization reports:
    - Name and date of data set; type (archaeological, geophysical, etc.); source and URL (if appropriate); publicly or privately held (if private, provide name and point of contact information); digital or analog; primary contribution of dataset to project (interpretation of subbottom data, summary of regional geologic history, etc.); positional accuracy, if applicable; estimation of project resources necessary to acquire, digitize, or integrate the dataset into project databases (low, medium, high); availability and quality of metadata.

3.3.2.4 Summary of the regional and local geology and geological history

A thorough understanding of the geological history of the study area is required for projects that aim to assess potential Tribal paleocultural sensitivity and identify cultural sites on the OCS. In the New England area, Tribal peoples interacted with an ancient glacial and post-glacial landscape and climate that was substantially different from current conditions and changed dramatically over time. A comprehensive review of the geologic history of the study area provides the framework for reconstructing the paleolandscapes that characterized the project area during the time period of interest and is needed for identifying geographic areas that may be culturally sensitive based on the type and preservation of relict landforms. In addition, understanding the geologic history of the study area is the foundation for interpreting newly acquired geophysical and geotechnical data accurately.

The following best practices provide additional guidance for understanding and summarizing the geological context of the project site as part of a desktop study:

- Research and summarize the available information on the geological history of the project area on both regional and local scales. A regional understanding of the geological processes, associated landforms, and deposits will assist in accurately interpreting and reconstruct the geological history of smaller, localized areas.

- Engage a local and/or regional expert in order to insure accurate interpretations of surficial sediments, sub-surface stratigraphy, and paleolandscapes.

- Provide a summary of the contemporary seabed geomorphology and marine processes in the study area. Understanding this information is necessary for assessing the potential for paleolandscape preservation.

- Provide a general summary of previously collected subbottom data in the area (if available), with particular focus on the geological interpretation of dominant acoustic reflectors that characterize the region. This information is invaluable when interpreting newly acquired data and placing it in a regional geological context.

- Avoid restricting geological history summaries to the late-Pleistocene and Holocene periods simply because those time periods are associated with the current archaeological record of human habitation. Earlier geological processes and deposits form the foundation for, and may intrude into and sometimes preserve, the geomorphology of these later periods of interest. Instead, focus on understanding and summarizing all of the geologic time periods, processes, and associated deposits that have been previously identified on the seabed, or through subbottom profiles (if available), in the study area.

3.3.2.5 Summary of the cultural history of the region for the time period of interest

A regional understanding of long-term human settlement and interaction with the environment is critical to understanding and predicting how these activities may be manifested in the archaeological record preserved in submerged environments. The following general best practices provide guidance about the importance of thoroughly researching and summarizing the cultural history of the study area as part of a comprehensive desktop study.

- Develop a summary of the cultural history associated with the study area as a basic framework for identifying known locations of cultural sites, as well as for informing predictive models regarding the predicted likely geological situations and locations where as-yet unidentified sites may be present, the types, ages, sizes, density and distribution across the landscape of such cultural sites, and their relationship to Tribal history and knowledge.

- Consult multiple sources of information when summarizing a regional cultural history including: results from previous investigations (academic and industry [i.e., cultural resource management reports] cultural studies), published histories, historical drawings, maps and charts, archaeological site files and site maps, and shared information and traditional knowledge from local informants from the region's Tribal communities.

3.3.2.6 Discussion of sea level change in the study area

An accurate reconstruction of late-Pleistocene and Holocene post-glacial sea level change is needed to identify the areas on the OCS that were once subaerially exposed and available for occupation by Tribal peoples. The following best practices provide additional guidance that should be considered when conducting pre-survey desktop research related to sea level history:

- Use relative sea level change curves for the study area when available. Regional or, more problematically, global sea level change curves will not accurately characterize conditions at a local level. Clearly identify the geographic location(s) on which the chosen sea level model is based.

- Understand and discuss the basis for sea level reconstructions that will be used during the project. Sea level rise on the OCS is not analogous to filling a bathtub, but is instead a complex interplay of multiple dynamic geologic and oceanic processes associated with elevation changes in the earth's crust and global sea water volume.

- If possible, identify the range of vertical uncertainty in the model to be used, and incorporate it into paleoshoreline reconstructions. Margins of error in the vertical dimension are associated with

geographic variations in paleoshoreline position, and this margin of error should be made apparent, so that the relative accuracy of the sea level reconstruction is obvious.

- If possible, note the number of measured sea level data points that the modeled sea level curve being used is based upon, and recognize that sea level curves represent a generalized best-fit averaging of those points, rather than a detailed depiction of the true variability that existed in sea level as a result of climatic fluctuations and intervals of temporarily warmer or colder periods over long periods of time. Such fluctuations produced temporary intervals of sea level drop, and "still-stand" (stable sea level) over time periods that would likely have been impactful on a human life or generational time-scale, even if not especially notable on a geologic time-scale in a curve based on limited sample of data points. The fewer the number of data points, the less resolved the curve, and the lower the confidence one should have in its accuracy.

3.3.2.7 Discussion of paleolandform preservation

From a geological perspective, the seafloor and sub-seabed on the OCS is simply a continuation of the adjacent exposed land, although one that has been impacted significantly and re-shaped by the marine inundation process. Formerly terrestrial paleolandscapes may have been destroyed, significantly altered, protectively buried by post-glacial marine transgression and modern marine processes, or some combination of these, and thus may not exist in a geographically continuous manner as they once did. Understanding the extent to which the primary paleolandscape surface and substrate has been modified is needed to accurately reconstruct the locations and types of paleolandscapes that have survived and to identify areas of potential paleocultural sensitivity within them. The following best practices may assist with efficiently conveying pre-existing knowledge regarding paleolandscape preservation within a given study area:

- Avoid assuming that relict elements of paleolandscapes are not preserved in a given study area, even though the inundation process associated with sea level rise is generally recognized as a process that is massively transformative and destructive. For example, formerly subaerially exposed sediments have been identified in the environmentally diverse Greenwich Bay and Block Island nearshore project study areas, and in the offshore Mud Hole study area of the Rhode Island OCS (unpublished data, this project). The preserved elements of the paleolandscape in these areas share in common the characteristic that they all appear to have been preserved because of their pre-inundation topographic situation; that is, they are all found in locations that were once within or on the margins of closed or partially closed topographic depressions (i.e., lakes, ponds, wetlands, floodplains) that were submerged rapidly after being breached and flooded by marine transgression, and then buried beneath terrestrial sediments redistributed by marine processes occurring during and after the shoreface erosion of the upper portions of nearby topographic highs. Being topographically low, and getting submerged and buried rapidly appear from the geologic evidence observed during this project to be key contributing factors that determine which elements of the inundated paleolandscape are preserved. General statements about preservation potential need to be supported with specific data.

- Summarize the current hypothesis about paleolandscape preservation in the study area, and clearly identify the amount and type of data on which the hypothesis is based. For example, a hypothesis that relict paleolandscapes are not generally preserved might be based on examination of a small number of geophysical surveys, suggesting that additional data acquisition and analysis is necessary to validate the hypothesis for a broader area.

- Provide representative visual examples of the geophysical and geotechnical data that have been used to assess paleolandscape preservation in the study area, or in nearby areas, and identify the

preserved features and processes that resulted in their preservation that support the hypothesis. This information will assist with reviewing newly acquired data.

3.4 Paleoshoreline Reconstructions: Developing a Preliminary Understanding of Where and When Currently Submerged Landscapes Were Subaerially Exposed in the Study Area

Once the desktop study has been completed, the first step towards assessing paleocultural sensitivity in submerged environments is to identify whether the study area was ever subaerially exposed during the late-Pleistocene and/or early Holocene period, which corresponds with the earliest archaeological evidence of human occupation in the Americas. This approach allows research efforts and resources to be devoted to geographic areas that contain preserved paleolandscapes that could have been inhabited by Tribal people and, therefore, could be culturally sensitive. The following best practices provide guidance for developing initial visualizations of estimated paleoshoreline positions.

- Use relative sea level change curves for paleoshoreline reconstructions whenever possible. Regional and, more problematically, global sea level change curves do not provide an accurate representation of sea level change in local geographic areas.

- Use relative sea level change curves that account for both isostatic and eustatic variation, as well as the impact of regional and/or local factors (e.g., impacts of glacial forebulge, deep burial by riverine deposits, and regional and/or local tectonic activity).

- Clearly define the source of the sea level change curve chosen for use in developing paleoshoreline reconstructions. If possible, identify the number of data points used to develop the curve, and the vertical inaccuracy inherent in the curve that is used. Small numbers of data points lead to artificial smoothing of curves and large degrees of error in the vertical dimension can translate into significant variations in the reconstructed geographic position of paleoshorelines.

- Use the following generalized procedure to provide a preliminary estimation of paleoshoreline positions for the time period(s) of interest in the study area:

    1. Identify the highest resolution bathymetric dataset available for the project area and use this dataset as the basis for the preliminary paleoshoreline reconstruction. This dataset should have been located and imported to a geospatial database during the desktop study phase of the project (Section 3.3 of this report). For use in the paleoshoreline reconstruction process, bathymetric datasets should represent continuous coverage for the entire study area, and be in raster format, where each pixel in the raster is characterized by unique latitude, longitude, and water depth values.

    2. Identify the highest resolution sea level reconstruction available for the project area and use it to identify the relationship between current sea level and paleo-sea level for each time period of interest. For example, 6,000 years before present (yBP), sea level might have been 15 m lower than it is currently in the study area, whereas by 3000 yBP, it was 6 m below its present level. Consultation with a regional expert in sea level change for the study area may be beneficial to identify which sea level reconstruction is most applicable.

    3. Using geospatial analysis software, combine the contemporary bathymetric dataset with the information obtained from the selected sea level curve to develop a new raster surface showing the locations of currently submerged areas that may have been subaerially exposed when sea level was lower than at present. The specific process for performing

this calculation varies according to the spatial analysis software chosen but is generally conducted on each pixel in the raster simultaneously.

4. If possible, identify the vertical error associated with the sea level change curve used in steps 2 and 3 above and delineate a margin of error for sea level reconstructions at each time period of interest. For example, the chosen sea level curve might indicate that at 6,000 yBP, sea level was 15 m lower present, with a vertical error of +/- 2 m. Therefore, sea level at 6,000 yBP could have been anywhere between 13 and 17 m below present level.

5. Create a series of maps showing the location of the hypothesized paleoshoreline for each time period of interest, based on the calculations performed in Step 3 above. If possible, include a visualization of how the vertical error in the sea level change curve influences hypothesized shoreline positions. Use the resulting maps to determine which locations (if any) in the project area were subaerially exposed and therefore were available for human habitation and potentially culturally sensitive.

- Ensure that the paleoshoreline visualizations created with the above procedure are regarded as preliminary hypotheses only. A detailed paleotopographic reconstruction (Section 3.5 of this document) that incorporates "backstripping" (identification and digital removal of the thickness of post-inundation marine sediment deposited in the study area) based on subbottom profile interpretations and analysis of sediment cores is required to accurately reconstruct the study area during the time period(s) of interest.

3.5 Paleotopographic Reconstructions: Understanding the Physical Characteristics of Preserved Paleolandscapes in the Study Area

The term "paleotopographic reconstruction" is used in this document to describe a representation of the physical and geological configuration of ancient land surfaces that were once subaerially exposed and potentially available for human occupation, but are now submerged and possibly buried beneath contemporary marine sediments. The primary goals of a paleotopographic reconstruction are to: 1) identify the characteristics of preserved relict landforms that survived post-glacial sea level change in the study area; 2) document the geographic location of these landforms; and 3) develop a visual representation (either 2D or 3D, depending on data density) of the relict land surface(s) in the study area for the time period(s) of interest. Note that paleotopographic reconstructions focus on the physical and geological configuration of the land surface only. An assessment of the potential cultural sensitivity of preserved landforms is conducted in later phases of the process (discussed in Section 3.7 of this document). The following best practices provide guidance regarding the reconstruction of paleotopography in the study area.

3.5.1 General Considerations

- Acknowledge that sea level rise is a predominantly destructive process, and that much of the terrestrial paleolandscape may have been significantly altered or destroyed entirely by erosion that occurred during and after its submergence.

- Understand that paleolandscapes that do survive inundation may be deeply buried beneath redeposited formerly terrestrial soils and sediments and/or post-submergence marine sediments and not visible on the surface of the ocean floor.

- Avoid using contemporary bathymetric data as the only basis for paleotopographic reconstructions or interpretations. Contemporary bathymetric surfaces may help with developing a preliminary hypothesis about paleoshoreline position(s) in the study area and may provide important clues about large or dominant features that might have characterized formerly exposed paleolandscapes. However, bathymetry represents the conditions of the seabed at the time that the data was recorded. These conditions may be very different from what the topographic conditions were like when the seabed was an exposed terrestrial paleolandscape.
- Adopt a phased approach to acquiring, processing and interpreting data that progresses from broad, regional, and non-disturbing remote-sensing activities and general questions to more focused, localized, and, if necessary, sub-surface sampling activities and specific questions. If the desktop study (see Section 3.3 of this report) did not locate enough data to provide a general geophysical and geological understanding of the regional area, focus new data acquisition efforts on a regional scale, and narrow the analyses as more data is collected.
- Combine multibeam bathymetry, side scan sonar, subbottom profiler survey data, sediment coring, and Tribal traditional environmental knowledge (if available) to create the most robust, holistically developed, evidence-based paleotopographic reconstructions.
- Understand that accurate paleotopographic reconstructions, particularly in situations where a continuous 3D surface reconstruction is desired, require large amounts of high-quality, high-resolution data acquired over closely spaced survey transects that are expensive and time-consuming to collect and process, and require significant expertise in marine geophysics and geologic processes to interpret.
- Recognize that high-resolution subbottom data acquired in a grid pattern, with equally spaced crossing lines extending over the entire study area, will provide the best data for generating accurate 3D reconstructions of submerged and buried paleotopography.
- Apply a tiered or phased approach to paleolandscape reconstruction that reflects the resolution of existing data and data collection resources that are available for each unique study area. The resolution of geological and geophysical data available for a given study area will dictate the extent and accuracy of the paleolandscape reconstructions that can be produced from those data.
- Ensure that budgetary resources are adequate to collect and analyze sediment cores to confirm the interpretations of remotely sensed data used in the reconstruction of the paleolandscape. The number of cores necessary will depend on the homogeneity and/or heterogeneity of the study area's sediments. The more heterogeneous the area, the more cores will be necessary.
- Avoid using paleotopographic reconstructions as decision-making tools without a thorough review and understanding of the methods used to create the reconstruction and their degree of uncertainty.
- Develop protocols to ensure that paleolandscape reconstructions are statistically robust enough to support the research goals of the study and are not misused, particularly with respect to assessing the specific locations of culturally sensitive areas.

3.5.2 Data Acquisition, Processing, Interpretation, and Archiving

The best practices that follow provide additional general guidance that results from the research conducted as part of the Submerged Paleolandscape Project.

- Interpret a combined data set consisting of remote-sensing data (multibeam bathymetry, subbottom profiler, sidescan sonar, sediment cores, and Tribal knowledge and information, if available) to create the most robust paleolandscape reconstruction.

- Select geophysical surveying equipment based on a thorough understanding of the local and regional geology in the study area, and an up-to-date review of recently acquired survey data in the region (if available). A one-size-fits-all approach to geophysical surveying should not be expected to produce optimum results in all geographic settings. A suite of sound sources selected on the basis of local conditions should be made available. For example, at the time that this report was being written, regional surveys of the OCS off of the eastern U.S. from Maine to Florida are being conducted as part of BOEM's Hurricane Sandy Coastal Recovery and Resiliency program (project in progress). These preliminary datasets and surveying completed by the project team on the Rhode Island OCS (Coastal Mapping lab, unpublished data) indicate that high-frequency CHIRP sonar generally does not achieve adequate penetration in sandy bottom types to provide the data necessary for paleotopographic reconstructions. A lower-frequency system with a more powerful source (e.g., Bubblegun- or Boomer-type systems, or lower-frequency CHIRP) is necessary to achieve appropriate penetration (> 5–10m) for comprehensive paleotopographic reconstructions. In some cases, it may be appropriate to run multiple systems simultaneously and collect data.

- Conduct subbottom profiler surveys using the narrowest trackline spacing possible, within the time and budgetary constraints of the project. Data collected at narrow line spacing requires less statistical interpolation to produce a continuous topographic surface, and therefore will result in a more accurate representation. The resolution of the final gridded surface will be a function of the line spacing.

- When analyzing subbottom data to reconstruct the paleolandscape, always apply back-stripping techniques to the data to remove the acoustic section of the record corresponding to marine sediments deposited during post-glacial sea level rise. Paleotopographic reconstructions that do not employ backstripping techniques are inaccurate, because they include sediments that were deposited during and after inundation in a submerged environment rather than in a terrestrial one.

- Accurate ‘backstripping’ requires a thorough understanding of the regional glacial and post-glacial geological history of the study area, substantial expertise in interpreting subbottom profiles, sufficiently powerful computer hardware, and significant software-based data processing skills.

- Develop Federal Geographic Data Committee (FGDC)-compliant metadata for all geophysical and geotechnical datasets. Metadata should be included for all raw, processed, and geospatial data products.

- Be sure to understand data archiving requirements associated with the study area characterization project and comply with all regulations for data transfer and archiving at the conclusion of the project.

3.5.3 Creation and Use of Computer-generated 2D and 3D Paleotopographic Reconstructions

To create a paleotopographic reconstruction, subbottom profiles are examined for acoustic reflectors indicative of terrestrial paleolandforms and geological depositional environments in the time period of interest, and sediment cores are collected in areas where the subbottom data suggests that subaerially

exposed sediments appear to occur. Geophysical and core data are combined to produce a generalized illustration of the study area before post-glacial marine sediment was deposited in the area. In situations where geophysical surveying has been conducted at close line spacing, 2D or 3D visualizations can be created using geostatistical software to interpolate the configuration of the land surface located between the subbottom tracklines. Creation of these reconstructions requires a significant amount of interdisciplinary data, as well as advanced technical expertise to accurately interpret the conditions in the study area. The amount and type of data available, and each project's goals and resources will significantly affect the procedures used to create paleotopographic reconstructions, and the accuracy and utility of those reconstructions

Many available computer software packages are available (e.g., ArcGIS, AutoCAD, Fledermaus, etc.) allow users to create visually appealing 2D and 3D reconstructions of paleotopography. Frequently, toolboxes for surface creation are embedded in the software, making it fairly straightforward for many users to produce surface reconstructions. These reconstructions can be powerful tools for understanding the paleotopography of a study area; however, significant caution must be employed in order to create and use these images in a responsible and effective manner. A computerized reconstruction can be visually appealing without being an accurate representation of the paleolandscape. A thorough understanding of the assumptions, methodologies, and statistical variables used to create digital reconstructions is required to ensure that they are not misused. Because of the great variety of available software packages with different capabilities, development of a standardized methodology is problematic. The following best practices provide general guidelines for the creation of 2D and 3D paleotopographic reconstructions.

- Acknowledge that the construction of continuous 2D and 3D digital topographic surfaces requires computer hardware and software that is capable of performing sophisticated statistical interpolation procedures based on what are often very large datasets. Significant technical expertise is required to understand and use the software efficiently and accurately.

- Understand that the accuracy of continuous 2D and 3D topographic surfaces is dependent on two primary factors: 1) subbottom profile data quality and trackline spacing; and 2) the statistical method that is used to interpolate the landscape surface between tracklines. Develop a thorough understanding of the datasets contributing to the reconstruction and choose the most accurate surface interpolation algorithm based on a thorough understanding of the statistical parameters on which the interpolation is based.

- Document the subbottom trackline spacing, post-processing techniques, computer software, and surface interpolation method (including resulting statistical accuracy) and include this information with all paleotopographic reconstructions as part of the image legend, as well as in the metadata of the associated digital file. Avoid providing this information only in the body of an associated report, because images are frequently extracted from reports and used as stand-alone visuals in presentations, or for discussion purposes.

3.6 Paleoenvironmental Reconstructions: Understanding the Environmental and Climatic Conditions Characterizing Preserved Paleolandscapes in the Study Area

In the context of this report, the term "paleoenvironmental reconstruction" is used to represent the identification of local and regional ecological and climatic conditions that occurred during the past and were experienced by Tribal peoples. The goal of a paleoenvironmental reconstruction is to develop an understanding of the past physical conditions of study area only, not to assess the cultural sensitivity of

the area. The best practices below provide general guidance about the methodology required for accurate paleoenvironmental reconstructions.

- Recognize that robust paleoenvironmental reconstructions are based on the collection and analysis of sediment samples, primarily from sediment cores. Remote-sensing data in the form of bathymetry, sidescan sonar, and subbottom profile data are important facets of paleoenvironmental reconstructions, but should not be used without accompanying sediment core data.

- Significant expertise is required to determine the number of cores and types of proxy analyses that will produce the most comprehensive paleoenvironmental reconstruction for a particular study area. The geographical location, extent and quality of previously existing data regarding the geological and paleoclimatic history of the area, geologic characteristics of the study area, and availability of resources for data collection dictate the extent to which paleoenvironments can be accurately reconstructed.

- If working in a coastal environment, it is preferable to base paleoenvironmental reconstructions on core data obtained from both fresh water sites and estuarine and/or marine sites, because different proxies can be analyzed in each environment that when synthesized can provide a more holistic picture of paleoclimate change, variation in resource type and availability, and indicators of human activity and human disturbance.

- Design studies using a suite of proxy indicators that will distinguish environmental changes caused by climate change from those caused by human disturbance (see table below).

- Use the following general procedure for paleoenvironmental reconstructions of currently submerged areas:

    1. Identify and characterize the preserved geological environments (e.g., glacial lake, river channel, coastal plain, estuary, salt marsh, marine, etc.) that are visible within a given study area using geophysical survey techniques. (See Section 3.5).

    2. Collect enough sediment cores to characterize each distinct geological environment for ground-truthing interpretations made from geophysical data. Determining the precise number of sediment cores required to accomplish this will depend on the complexity of the study area's geomorphology.

    3. Split cores into two half-rounds to create an archival half and a working half. Photo-document the entire core digitally and prepare narrative and graphic descriptions of the core's sediments. The archival half should be preserved intact, unless demand for the sample exceeds the volume of the working half. In that case, the archive half may be sampled; however, a minimum of an archive quarter (half of the half) must be retained, and no interval may be depleted under any circumstances.

    4. Agencies should strongly consider establishing a national inventory for cores and other samples obtained in studies of the OCS. A small number of geological repositories funded by the National Science Foundation (NSF) exist in the United States. Agencies should investigate storing cores obtained by BOEM-funded or permitted projects at these repositories.

5. Conduct geotechnical analyses, including magnetic susceptibility, wet bulk density, P-wave (compressional wave) velocity, bulk-chemistry, etc., preferably at a 2-cm sampling interval or less. Automated core logging systems and XRF (x-ray florescence) and XRD (x-ray diffraction) scanners are particularly useful. These data provide important information regarding paleoenvironmental conditions, as well as assist with core correlation, across the study area.

6. Subsample the working core half to develop paleoenvironmental proxies for the sampled area, and complete the laboratory analyses for these proxies.

7. Subsample the working core half to extract organic materials for radiocarbon dating, and conduct dating analyses. AMS (accelerator mass spectroscopy) radiocarbon dates on plant material of terrestrial origin are most likely to yield accurate ages.

8. Use the geological and paleoenvironmental proxy data, combined with results from radiocarbon dating, to develop an age model for the study area.

9. Combine all resulting data to reconstruct the changes over time in the regional and local geologic, ecological and climatic conditions experienced by Tribal peoples within the study area.

10. Determine if any observed changes are likely to reflect human disturbance in the study area rather than paleoenvironmental change.

- Follow a weight-of-evidence, alternative hypothesis testing approach when synthesizing and interpreting core data. This approach involves amassing the evidence for or against a particular alternative hypothesis and accepting or rejecting that hypothesis on the basis of a preponderance of evidence in favor of or opposed to that hypothesis. Interpretations made using this best practice approach will likely be correct. If the evidence is equivocal, then either gather additional evidence, or forgo an interpretation.

- Conduct the following paleoenvironmental proxy analyses on sediment cores collected from the project study area:

Analysis	Info Provided	Methodology Reference
Magnetic Susceptibility	Intervals of high/low soil erosion and core correlation	Dearing, 1994
Biogenic Silica	Intervals of high/low productivity	Schelske, et al, 1986
Nitrogen Isotopes	Intervals of high/low productivity	Hubeny, et al., 2009 King, et al., 2008
Fossil Pollen and Charcoal	Vegetation type, climate change and human land-use indicators	Brugam, 1978 Delcourt and Delcourt,2008
Foraminifera	Marine environment and marsh sub-environment interpretation and used for sea level change curve reconstruction	Engelhart, et al., 2009

Analysis	Info Provided	Methodology Reference
D/H Hydrogen Isotopic Analysis of Behenic Acids	Paleotemperature in catchment of freshwater lakes	Hou, et al., 2011
Oxygen Isotopes and Alkenones	Paleotemperature in estuarine and marine environments	Stott, et al., 2004 Zhao, et, al., 2000
Bulk-Core Chemistry from XRF	Possible human activity proximal to the coring site	Gagliano, et al., 1982
Micro-Debitage	Stone tool making activity proximal to the coring site	Sonnenburg, et al., 2011
Secular Variation Studies of the Magnetic Field	Dating of cores	King and Peck, 2001
Plant Macro-Fossils	Vegetation type, potential food sources, useful for AMS dating	Watts and Bright, 1968 Gillespie, et al., 1991

3.7 Assessing the Paleocultural Sensitivity of Preserved Paleolandscapes in the Study Area

Assessing "paleocultural sensitivity," or the likelihood of given area of the submerged paleolandscape to have been used by Tribal people, resulting in the presence of paleocultural sites, requires a complex combination of archaeological, geological, and geophysical analyses, combined with the knowledge and input of Tribal research partners. The following best practices focus on providing recommendations for determining the variable likelihood of paleocultural sites to exist within the relatively smaller areas of the seafloor that have been identified as containing preserved elements of the now-submerged paleolandscape.

3.7.1 Using Predictive Models to Inform Paleocultural Sensitivity Assessments

As discussed in Section 3.1 of this document, the meaning of the term "model" can be interpreted in several ways and can represent different processes and outcomes that vary according to academic research subject. For example, maps created by geospatial computer software that illustrate geographic areas of differing archaeological sensitivity are considered "models" by some researchers. In other academic disciplines, this type of map would be considered the end result or "output" of a model, and the model itself would be defined as the processes used to create the map. In still other research fields, the term "model" is used to represent a three-dimensional visualization of an object or landscape. Each of these uses of the word "model" are valid, but are associated with different goals, methodologies, and final products. Therefore, when discussing the use of predictive models to assist with locating potentially culturally sensitive sites, it is crucial that all involved members of the research partnership agree in advance upon what is meant by the word "model," and what outcomes and products are expected. This type of clarification is not merely a matter of semantics, but is very important for understanding and effectively establishing the goals, methods, workflow and outcomes of a model.

Traditional archaeological predictive models are often presented in the form of a map that illustrates geographic areas of "low," "medium," or "high" predicted cultural sensitivity. These models are based on inferences that are made about how Tribal peoples responded to and interacted with variable elements of the paleoenvironment and paleolandscape, as documented in the accumulation of terrestrial archaeological evidence. By understanding and quantifying the archaeological record onshore, and noting

these particular conditions, a suite of "predictive" variables can be developed that can be applied to unstudied geographic areas, such as the sea floor. For example, if a large number of sites have been documented near lakes, proximity to lakes might be used as one of many variables to assess the predicted cultural sensitivity for unstudied areas. This type of modeling has been used with some success onshore in terrestrial settings, as well as in nearshore settings.

The current difficulty with applying traditional archaeological predictive modeling to submerged environments is the limited quantity of pre-existing detailed geologic and paleo-environmental data that is publicly available, and the near total absence of archaeological data on the locations, types, dates, sizes, and distribution of archaeological sites in submerged environments. Offshore, even basic information about the extent and locations of preserved paoleolandscapes, and the geomorphologic characteristics of those landscapes that submerged sites would be found within, is absent. In contrast to the now-submerged formerly terrestrial paleocultural landscape offshore, the onshore terrestrial environment has been continuously occupied by Tribal people for thousands of years. Tribal and non-Tribal researchers have been conducting archaeological studies on this land for more than a century, and have identified tens of thousands of cultural and archaeological sites. Onshore, it is also possible to physically walk across and visually observe the landscape. Completing comprehensive site assessments and conducting new archaeological surveys to identify sites is comparatively easy on land.

Conversely, submerged sites identification is dependent on research vessel-based geophysical remote-sensing survey and geotechnical sampling equipment for acquiring sediment cores and, in situations where conditions allow, diver or remotely operated vehicle (ROV) investigations to visually examine, identify, and, if necessary, perform more targeted sub-surface sampling of archaeological and cultural sites. Some offshore areas are characterized by oceanographic conditions that make extensive onsite sampling logistically problematic, such as environments in which the water depth, poor underwater visibility, high seas, or strong currents preclude diving or ROV operations, or where bottom conditions interfere with the collection of high-resolution acoustic data or sub-surface sediment samples. For the submerged environment, the most immediately pressing question to be answered is not yet "Where and how did ancestral peoples interact with the formerly terrestrial paleocultural landscape?" but rather "Did any elements of the paleocultural landscape they could have interacted with survive the inundation process intact and undisturbed?" If intact paleotopography has been identified, a variety of additional questions must be answered, such as: "How disturbed are the paleolandscapes?" "How deeply buried are they?" "How far do they extend?" "What kinds of paleoenvironments are represented where cultural sites may have existed in the past, based upon what we know from the observed relationships of cultural sites and paleoenvironments seen in the onshore archaeological record and as recorded in Tribal histories and traditions?" "Why have they survived?" "What are the geologic and oceanic conditions and processes that contribute to preservation?" "Can they be identified, measured and predicted?"

The assessment and development of predictive models is the subject of an additional project report, and is outside the scope of this document. The following best practices provide generalized guidance for using models to assess predicted cultural sensitivity in submerged environments.

- Avoid using the term "model" unless the processes used to create it, and the expected output, is clearly defined in each circumstance where a model is used or discussed.

- Avoid regarding a map illustrating geographic areas of varied predicted cultural sensitivity as a "model," unless the process used to create it is clearly described, reproducible, and testable. Similarly, a sensitivity map should not be called a "model" simply because it was created using computer software.

- Use archaeological predictive models cautiously, with a thorough understanding of the assumptions, biases, and processes that underlie the models. Include a discussion of this information in any situation where a model is used. Recognize that models are not reality, but are predictors of reality representing hypotheses that require testing to confirm, refute or revise, and whose accuracy is only as good as the data used to create them.

- Recognize that paleolandscape reconstructions alone will not produce an accurate prediction about the location of culturally sensitive areas. Traditional Tribal knowledge regarding the paleolandscape, and the nature of cultural perceptions of and interactions with that paleolandscape, are important to know in order to create a more complete paleocultural sensitivity assessment and locational model for sites.

- Acknowledge that far more environmental and archaeological data exists for the onshore environment than does for the offshore environment, and that the limiting effect this has on the scope, resolution and accuracy of offshore paleoenvironmental reconstruction and archaeological modeling efforts is extremely significant.

- Avoid using archaeological predictive models as the primary basis for policy decisions. Instead, regard archaeology-based predictive modeling applied to the OCS as just one of several tools that is still in an early developmental stage and largely unavailable to help guide cultural resource management planning for the OCS.

- Understand that robust archaeological predictive modeling requires large amounts of high-quality data, and significant technical expertise with complex statistical and data processing computer software.

- Regard map-based archaeological predictive models are visual hypotheses that illustrate geographic areas of predicted or potential cultural sensitivity that *must* be further tested through investigations, which may include direct sampling (acquisition of sediment cores, investigation and sub-surface sampling by archaeological divers, etc.) in the study area. Predictive models should not be regarded as the end result of the cultural sensitivity assessment process, but as a tool that informs and helps guide additional surveying and, if necessary, selective sub-surface testing in a given study area.

- Understand that the accuracy of predictive models is dependent upon the amount and type of data used to create them. Ensure that models are designed so that they can be updated and revised as additional data becomes available.

- Recognize that predictive models are based on inferences made from interpreted archaeological and environmental data regarding how people in the past interacted with the paleoenvironment. Inclusion of oral historical information or other forms of input from Tribal research partners can provide additional perspectives for interpreting archaeological and environmental data that result in more developed, more comprehensive, and more accurate inferences.

- Understand that geographic areas designated as “low sensitivity” by predictive archaeological sensitivity assessment models may, nonetheless, contain some of the most important cultural and/or archaeological sites. For example, the Sandy Hill Site in Mashantucket, Connecticut, a unique Early Archaic period site consisting of subterranean dwellings distributed on a steeply sloping hillside, was found in a location typically designated by archaeologists as “low

sensitivity" because of its location on a steep slope (Forrest 1999; Jones 2002; Jones and Forrest 2003).

- Avoid using predictive models to delineate geographic areas that do not have to be surveyed or that can be impacted without concern for potential effects to cultural sites due to their "low sensitivity." Acquiring survey data from areas predicted to have "low archaeological sensitivity" is as necessary as surveying areas predicted to have "high archaeological sensitivity," albeit possibly at a lower sampling density. Areas that have not been surveyed should warrant more survey than those that have been investigated previously. In other words, the less information we have about an area, the more important it is to ensure that a "reasonable and good faith effort" is made to identify historic properties.

- Develop methods to ensure that predicted archaeological sensitivity maps are not misused. For example, require that all models presented as computer-generated maps summarize the processes and data on which the maps are based in the map's legend and metadata, where appropriate, instead of simply as part of the report's narrative text. This ensures that if the archaeological sensitivity maps are extracted from their associated report for presentation or summary purposes, they will still contain the information necessary for confirming the map's accuracy and for interpreting it correctly.

- Investigate whether alternative approaches to traditional archaeological predictive modeling may be valuable for assessing predicted cultural sensitivity in submerged environments, particularly in situations where data acquisition opportunities are limited by unfavorable conditions (e.g., water depth, underwater visibility, bottom types that interfere with the acquisition of high-resolution subbottom profiles or sediment coring, etc.). "Significance Modeling" and "Expert Informed Priority Area Planning," (Doelle 2016) may provide complimentary methods for assessing cultural sensitivity.

3.7.2 Testing Predictive Models and Identifying Paleocultural Sites

All archaeological predictive models, whether developed statistically from quantitative data or based on qualitative data, represent hypotheses about the variability of potential cultural sensitivity across a given study area. Testing of these hypotheses requires direct observation to determine presence or absence of physical evidence of cultural sites. Depending on the circumstances of the paleolandscape being investigated, this direct observation should be accomplished whenever possible through non-disturbance visual survey (i.e., observation and visual documentation using divers or submersible technologies, such as ROVs fitted with video cameras), and/or through sub-surface sampling (i.e., acquisition of sediment cores or excavation of underwater archaeological test units).

Whenever sub-surface sampling is being considered and performed, the development of a sampling plan and the execution of that plan should be accomplished to the fullest extent possible with the direct engagement and involvement of the project's Tribal research partners to ensure the sampling is conducted in a culturally sensitive and appropriate manner. Sampling should be planned in such a way that its impacts to the cultural sites, seafloor, and marine life are minimized. The field sampling program should include time and opportunities for the planning, preparation, and performance of traditional Tribal ceremony or ceremonies. Non-Tribal research partners should be included in these ceremonies whenever possible and deemed appropriate by the Tribal research partners. A detailed plan developed with the project's Tribal research partners for addressing the discovery of human remains should also be a fundamental element of any sub-surface sampling program (including sediment coring). Additional recommended best practices for predictive model testing and identification of submerged cultural sites are as follows:

- Recognize that the ability to identify submerged paleocultural landscapes and Tribal historic properties in submerged environments will be a direct function of the available geoarchaeological data's scope, quality and resolution, and the degree to which Tribal knowledge is shared. Use high-quality, high-resolution data collected with multiple instruments over broad areas of the seafloor, combined with geotechnical and archaeological samples, analyzed and interpreted by an experienced multi-disciplinary team of non-Tribal and Tribal scientists working together represents the optimal situation.

- Understand that there is a significant preservation differential of organic materials between sites preserved in submerged environments (better) compared to those found on most terrestrial environments (worse), which will influence site identification methods. Well-preserved submerged cultural sites would likely contain an abundance of organic materials compared to those from similar contemporaneous sites found on land where preservation of organic materials is exceedingly rare.

- Understand that there are different methodological requirements for identifying and characterizing submerged paleolandscapes than there are for identifying cultural deposits preserved within them. Preserved paleolandscape elements are likely to cover comparatively broader expanses of the sea floor, as compared to cultural deposits located within them, which are likely to be smaller in size and distributed more discretely across the paleolandscape.

- Recognize that adequate experience, equipment and facilities are needed for recovering and stabilizing submerged cultural materials while in the field, and for analyzing, conserving and curating artifacts in perpetuity that are recovered as part of the predictive model testing and site identification processes.

- Understand that there seem to be two overall lines of thought regarding the identification of paleoenvironments that have the potential to contain cultural sites:
    - The identification of edges (i.e., marine and fresh water shorelines and channel margins). These are areas that were periodically submerged or inherently wet, unstable, and while unattractive for settlement, were likely locations where humans interacted with the water in various important ways; and
    - The identification of inland areas consisting of a mosaic of different types of paleolandsurfaces.

- Consider erosion-resistant, organic-rich, marshy and/or peaty deposits formed in topographic lows or deposited in nearshore paleoenvironments on the margins of water bodies to be areas with greater potential for post-inundation preservation of the submerged paleolandscape and paleocultural deposits within it.

- When reviewing survey data, look for upland elements of the submerged paleolandscape, which, although typically eroded, may be preserved in isolated instances if they have been buried and protected beneath more erosion-resistant tree remains, rocks, and peat deposits.

- Maintain an open mind about the possible range of site ages and types that may be present offshore. For example, locations where organic materials are preserved to an extent typically not found on sites identified in terrestrial archaeological contexts, or ceremonial stone features and landscapes that may be only identifiable by Tribal people.

- Do not regard the absence of evidence as evidence of absence. The small number of submerged paleocultural landscapes that have been identified thus far should be seen as a direct function of the limited amount and efficacy of investigations that have been performed to date, rather than an indicator of their potential to exist.

- Use high-resolution survey systems and conservative trackline spacing (as little as 10 m) when conducting detailed identification surveys for submerged cultural sites.

- Conduct geotechnical sampling or archaeological excavation with sufficient detail and precision to determine and document the geomorphological context of identified cultural sites.

- Identify exposed or shallowly buried (1 m or less) paleolandscapes and submerged cultural sites by employing archaeological divers to:

    - Conduct visual reconnaissance surveys in a grid pattern to document stratigraphy, and identify and map sites.

    - Delineate site extent using diver-operated hand-coring and/or sub-surface induction-dredge testing where the paleolandscape is not deeply buried by marine sediments and the waters are safe for conducting diving operations. Anticipate six to seven times more effort to excavate the same size and number of test pits underwater as the time required to excavate them on land, based on the additional costs, personnel, and logistical issues associated with diving, underwater excavation equipment, a vessel or floating platform for staging the excavation, and the generally slower pace at which underwater excavation proceeds.

- When performing underwater archaeological excavation, make it a standard practice to feed sediments excavated by hand into the 'head' or suction end of the underwater induction-dredge, rather than excavating by plunging the dredge-head blindly into the sediments. The former practice will to minimize the disturbance of the sea floor, thereby maintaining optimal underwater visibility within the test unit and ensuring greater control while excavating. This practice is also respectful of the Tribal preference for minimally impactful research. It reduces the likelihood of disturbing human remains, if encountered, and inadvertent damage or destruction of fragile organic cultural materials and ecofacts typically found preserved on submerged cultural sites.

- Affix a mesh bag (3 to 6 mm mesh size) to the exhaust end of the dredge hose to capture any artifacts and ecofacts not recovered by hand during the underwater excavation process. Change out the bag as each natural stratum or arbitrary level is excavated and have surface personnel sort through the bag's contents to recover artifacts and ecofacts for subsequent documentation, cataloging, preservation and curation, as warranted.

- Use vessel-based coring and industrial dredging systems for site identification surveys of submerged paleolandscapes buried too deeply (1 m or more) under marine sediments to be excavated by archaeological divers or located in waters too deep or unsafe for diving.

- Use vessel-based coring to verify results and interpretations of geophysical and/or remote sensing survey data acquisition and analysis, to assist in the identification of submerged paleolandscapes, to identify cultural sites, and to guide sub-surface archaeological testing by using markers, such as micro-debitage presence and density and sediment chemistry data.

4.0 Conclusions and Next Steps

Federal and State agencies, Tribal communities, THPOs, researchers, and the public share concerns regarding the potential impacts of offshore development on submerged cultural resources, including preserved ancient landscapes with cultural sensitivity for Tribal peoples. Discussions that took place during BOEM's 2011 Atlantic Wind Energy Workshop led to the State of Rhode Island and the Narragansett Indian Tribe approaching BOEM to assist with this concern, which resulted in BOEM funding the Submerged Paleolandscapes Project, and the development of the best practices presented in this document. Though these best practices were created within a Rhode Island geographic research context, they are intended to be broadly applicable to multiple geographic areas. Best practices should be seen as dynamic recommendations that require periodic updating as new information, technologies, ideas, and priorities become available and evolve over time.

This document provides recommendations and guidance for agencies, Tribal communities, and researchers about developing and sustaining positive relationships with one another, particularly when conducting the research necessary to assess the paleocultural sensitivity of submerged environments. The best practices discussed above can be applied within multiple cultural and related environmental review contexts. The document also discusses underlying issues that affect these relationships and provides suggestions about how existing relationships can be improved. Respectful engagement and collaborative relationships are the foundation for mutually beneficial and successful research and government-to-government consultation. Consultation cannot be expected to function optimally without an established basis of respectful and effective communication, trusting and mutually beneficial relationships, and shared capacities among the involved groups to become and remained engaged as collaborative partners. The document also provides specific recommendations regarding the scientific analyses that are required to conduct a thorough paleocultural sensitivity assessment in submerged environments, including guidance for using predictive models to identify locations of potential cultural sensitivity.

The results of the Submerged Paleolandscape project highlighted multiple areas that require additional development in order to support future multicultural collaborative research and marine spatial planning in submerged environments. Three key areas for which immediate action could be implemented are summarized below, along with three recommended next steps for beginning to address them.

1. **Develop a standardized methodology for identifying areas of paleolandscape *preservation* in submerged environments, instead of attempting to use predictive models to simply locate areas with the highest potential for containing submerged archaeological *sites*.**

   Applying traditional archaeological predictive modeling approaches currently used on land to the OCS is problematic due to the limited amount of pre-existing geologic and paleoenvironmental data that is available and, with a few exceptions, the near total absence of detailed archaeological data for the submerged environment. In addition, developing models of paleocultural sensitivity in submerged environments requires almost total dependence on geophysical remote-sensing and geotechnical sediment sampling equipment, making it extremely challenging to conduct the highly detailed level of archaeological site identification and evaluation that is necessary for testing predictive models. The most important question currently to be answered about the paleocultural sensitivity of submerged environments is not "Where and how did ancestral peoples interact with currently submerged paleolandscapes," which traditional predictive models might assist with, but instead, "Are any paleolandscapes actually preserved in the area of interest?" If preserved paleolandscapes are located, then additional investigations to assess the extent of preservation, the type of oceanographic processes that resulted in their preservation, and the paleoenvironmental characteristics of the preserved landscape must be conducted before any assessment of paleocultural sensitivity can be initiated.

In addition to the current lack of geologic, geophysical, and cultural data available for submerged environments, researchers and Tribal representatives who attended this project's Initial Workshop emphasized that the results of predictive models should not be used as the primary method for decision-making to identify geographic areas of cultural importance (Coastal Mapping Laboratory, 2015). For these reasons, research in the near future should focus on addressing data gaps in the submerged environment to understand the extent and type of submerged paleolandscape *preservation*, rather than on applying predictive models to poorly defined submerged environments in an effort to identify archaeological sites.

- Until additional data becomes available, and the capacity of agencies, Tribes, and researchers to share information respectfully and collaboratively improves, adopting a more holistic, Tribal Cultural Landscape approach to the site identification process (Ball, et al. 2015) should be investigated and considered. This approach views preserved relict landforms, not "sites," as places of cultural importance.

- Investigate alternative methods to traditional archaeological predictive modeling to assess areas of cultural importance in submerged environments. Begin with a thorough literature search across multiple disciplines about the types of models that may be of assistance, and then develop pilot studies to test the models for assessment of paleocultural sensitivity in submerged environments.

- Develop a comprehensive, publicly available, digital geospatial database of geologic, geophysical, and archaeological information available for the OCS and other submerged environments of interest. Include a compilation of the sea level change models available for each area, and contact information for researchers with demonstrated expertise in the geology, geophysics, and archaeology of each geographic area. Include contact information for Tribal representatives, and links to information about Tribal history, practices, and cultural priorities for each area. Consider providing funding opportunities for agencies, local researchers, and Tribes to work together to develop this database.

2. Increase the capacity of Tribal communities, agencies, and academic researchers to work together in a mutually respectful and beneficial manner.

The identification and protection of submerged paleocultural landscapes benefit from an approach that is multi-disciplinary and multicultural in nature. Applying the diverse perspectives, information, ideas, and knowledge of engaged partners from the agency, scientific, and Tribal communities to the research and management problems associated with submerged paleocultural landscapes identification and protection offers the best opportunity for the most comprehensive and mutually agreeable solutions. Successful collaboration requires each partner to have established baseline capacities necessary for working together. Groups that have adequate staff (with the necessary interest, experience, knowledge, training, and skills), facilities and infrastructure, and sustainable sources of funding will be most able to implement best practices and be optimally positioned to take advantage of opportunities to collaborate or consult. Consequently, building capacity across these communities must be seen as a priority.

- Identify one or more staff members who want and are qualified to serve as the group's lead for developing and maintaining increased capacity for engaging in collaborative relationships with other groups. This and/or these individual(s) should have demonstrated prior experience, success, and a genuine commitment to facilitating collaboration with diverse groups.

- Initiate regular in-person meetings between the identified staff member(s) representing each group to provide enhanced capacity for relationship building. Meetings should be held at least twice a year (or as often as mutually agreed upon) with each meeting organized and led by one of the groups, following a rotation that changes with each meeting. The purpose of the initial meeting would be to: a) present and discuss key recommendations of this best practices document; b) to review and reach a consensus regarding baseline requirements for effective, respectful oral and written communications; and c) discuss development of a mandatory, cultural sensitivity training program for all individuals involved in these meetings and the establishment of collaborative relationships between the groups. The training program is to be created by Tribal and non-Tribal group members and include education about the world-view, professional and personal responsibilities, goals, and concerns associated with each group that is participating in the collaborative relationship.

- Develop a Tribal ocean research consortium comprised of multiple Tribal communities united in their desire to build capacity to become active Tribal participants in the ocean sciences, and to engage Federal and state agencies, universities and other research groups in seeking funding opportunities.

3. Build personal relationships among individual members of the Tribal, agency, and research groups.

The development of sustainable, long-term, respectful and trusting relationships among the agency, Tribal, and research groups is required to foster collaborative, mutually beneficial decision making. The importance of this type of relationship between these groups is acknowledged by all, but the challenges associated with attaining them remain significant. It is necessary to recognize that each group is composed of individuals whose personal commitment is tied to an emotional aspect that frequently controls his or her feelings about the other groups, and, ultimately, defines the nature of the relationships. A personal commitment to multicultural relationship building is required for all individuals involved in collaborative activities.

- Seek opportunities to develop personal relationships with individuals from diverse groups in casual situations outside of the work environment. Informal interaction in one-on-one or small group settings provides an opportunity for a foundation of care, trust and understanding between individuals and groups to develop, and can be a powerful way to address and eliminate stereotypes and prevent conflicts.

- Non-Tribal individuals should consider attending local Tribal cultural events, such as powwows, musical performances, or public ceremonies, and, upon invitation, visiting nearby Tribal lands to see, experience, learn, and gain a deeper appreciation and understanding about traditional Tribal sciences, practices, ceremonies, and beliefs, as well as places in the landscape that are of importance to Tribal communities.

- Tribal individuals should consider attending “open campus” days at nearby research institution(s), or attending public lectures at local libraries, to gain additional insight into the scientific research process and projects underway in their local area. In addition, many local conservation groups, agencies, colleges, and universities offer opportunities to become “citizen scientists” by welcoming individuals of all ages and backgrounds to assist with data collection and interpretation for environmental monitoring projects. These experiences provide important opportunities for sharing diverse perspectives in a casual, friendly environment.

Overall, the Submerged Paleocultural Landscapes Project was a positive experience that created new relationships, strengthened existing ones, or, in some cases, clarified areas in need of improvement. It also better defined and enhanced the capacity for diverse groups to work together in this type of collaborative research. The project was not without its frustrations and negative experiences, as areas of concern and conflict, ignorance and misunderstanding, and deficits in the current capacities of agencies, Tribes and researchers to work together towards a common goal were revealed. However, identifying and acknowledging these challenges is a positive first step towards improving current and future collaboration. The Submerged Paleocultural Landscapes project provided an important opportunity for diverse groups to assess their priorities and capacities, share perspectives, and move forward together when responding to needs, opportunities and challenges related to the identification and protection of paleocultural sites in submerged environments.

From a scientific research perspective, the Submerged Paleolandscapes Project provided an important opportunity to evaluate existing geological and archaeological survey guidelines for characterizing and identifying culturally sensitive areas in submerged environments. Three paleocultural sites were identified embedded within preserved paleolandscapes in shallow (1 to 4 m deep), nearshore (10 to 30 m) Rhode Island waters of the relatively protected Greenwich Bay, and the more exposed West Beach on Block Island. Glaciolacustrine sediments were also located in cores obtained at the study area known as the Mud Hole, suggesting that a third paleolandscape may be preserved in deeper, higher-energy, offshore waters on the OCS. Analysis and interpretation of data obtained during field surveys in these project study areas contributed to a more comprehensive understanding of the potential paleocultural sensitivity of offshore areas on the Rhode Island OCS. Lessons learned from this research will contribute to the improvement and standardization of the current methods used to survey, interpret, and characterize submerged environments, regardless of project scope or geographic area.

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Department of the Interior (DOI)

The Department of the Interior protects and manages the Nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors the Nation’s trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated island communities.

Bureau of Ocean Energy Management (BOEM)

The mission of the Bureau of Ocean Energy Management is to manage development of U.S. Outer Continental Shelf energy and mineral resources in an environmentally and economically responsible way.

BOEM Environmental Studies Program

The mission of the Environmental Studies Program is to provide the information needed to predict, assess, and manage impacts from offshore energy and marine mineral exploration, development, and production activities on human, marine, and coastal environments. The proposal, selection, research, review, collaboration, production, and dissemination of each of BOEM’s Environmental Studies follows the DOI Code of Scientific and Scholarly Conduct, in support of a culture of scientific and professional integrity, as set out in the DOI Departmental Manual (305 DM 3).