Social Indicators in Coastal Alaska: Arctic Communities

Contract No. M11PC00032

Research Plan

Submitted to

Bureau of Ocean Energy Management (BOEM)
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ACRONYMS AND ABBREVIATIONS

ACS	American Community Survey
AEWC	Alaska Eskimo Whaling Commission
AHDR	Arctic Human Development Report
ANMB	Alaska Native Management Board
ASI	Arctic Social Indicators
BOEM	Bureau of Ocean Energy Management
COMIDA	Chukchi Offshore Monitoring in Drilling Area
COR	Contracting Officer's Representative
ICAS	Iñupiat Community of the Arctic Slope
ISQOLS	International Society for Quality-of-Life Studies
NPR-A	National Petroleum Reserve - Alaska
NRC	National Research Council
NSB	North Slope Borough
NSMB	North Slope Management Board
OMB	Office of Management and Budget
SDWG	Sustainable Development Working Group
SLiCA	Survey of Living Conditions in the Arctic
SOW	Statement of Work
SRB&A	Stephen R. Braund & Associates
USDOI	United States Department of the Interior
USGS	United States Geological Survey

INTRODUCTION

This document details the research plan and schedule for the Bureau of Ocean Energy Management (BOEM) study entitled "Social Indicators in Coastal Alaska: Arctic Communities." Stephen R. Braund & Associates (SRB&A) has been contracted to design and implement a social indicators system based on a household survey and existing data in six Arctic communities: Barrow, Nuiqsut, Wainwright, Point Hope, Point Lay, and Kaktovik. This research plan includes a description of the theoretical framework and hypotheses for this project, referred to as the North Slope Social Indicator Study, in addition to a description of tasks and the proposed methods and schedule to complete these tasks.

THEORETICAL FRAMEWORK

The foundation of the theoretical framework for this study has four major components:

1. BOEM legal mandates
2. Arctic Social Indicators (ASI) initiative
3. Survey of Living Condition in the Arctic
4. North Slope Social Impact Study

BOEM Legal Mandates

The theoretical framework is grounded on BOEM legal mandates. BOEM has national responsibility for "overseeing the safe and environmentally responsible development of energy and mineral resources on the Outer Continental Shelf" (USDOI, USGS, 2011). Under the mandates of the 1953 (amended 1978) Outer Continental Shelf Lands Act and the 1969 National Environmental Policy Act, BOEM anticipates, monitors, and mitigates adverse impacts of offshore resource development.

On June 23, 2011, the USGS released a study: *An Evaluation of the Science Needs to Inform Decisions on Outer Continental Shelf Energy Development in the Chukchi and Beaufort Seas* (USDOI, BOEMRE, 2011). While the study focused on the natural environment, it includes the following conclusions and recommendations directly relevant to this study:

- "Although general usage patterns are known, village [subsistence] surveys have been conducted intermittently. In some cases, the data are old enough and may no longer be representative of actual harvests." (Holland-Bartels and Pierce, 2011: 77)
- "Subsistence users may be among the first to notice changes in abundance and distribution of fish and wildlife species as it relates to climate change, development, and other stressors. Local traditional knowledge should be more formally incorporated and integrated into resource assessments." (Holland-Bartels and Pierce, 2011: 77)
- Issues "that must be considered when addressing comprehensive cumulative impact assessments" (Holland-Bartels and Pierce, 2011: 207):
    - Socioeconomic change
    - Impact on subsistence activities
    - Aesthetic, cultural, spiritual impacts

    - Human health effects
- "There are no known studies that attempt to separate the effects of oil and gas activities from other causes of socioeconomic change in communities of the North Slope of Alaska" (Holland-Bartels and Pierce, 2011: 207).
- "Human Communities – there is important missing information on the effects (beneficial and harmful) to the North Slope Communities; a better mechanism is needed to increase Alaska Native input into the research process and a way to translate their observations into hypotheses that can be addressed by research" (Holland-Bartels and Pierce, 2011: 208).

The Holland-Bartels and Pierce USGS study highlights the BOEM socioeconomic studies plan, "showing the progression in understanding through time of the social systems in Arctic Alaska" (Holland-Bartels and Pierce, 2011: 208). Figure 7-1 in their report shows "New Social Indicators" beginning in 2011 as contributing to this process (Holland-Bartels and Pierce, 2011: 209).

This study is thus an integral component of BOEM's response to its mandate to oversee the safe and environmentally responsible development of energy and mineral resources on the Outer Continental Shelf off of the North Slope of Alaska. Results will contribute to BOEM's ability to:

1. Describe living conditions in a manner in which changes can be tracked over time and compared with other Arctic regions.
2. Systematically incorporate subsistence user observations of changes in the environment so that potential causes of such changes can be identified, examined, and mitigated.
3. Understand the relationships between household-level differences in experience with oil and gas development and living conditions.

Arctic Social Indicator Development

A second foundation of the theoretical framework is the work of the ASI initiative of the Sustainable Development Working Group of the Arctic Council (Sustainable Development Working Group [SDWG], 2010). In 2004, under a commission from the Arctic Council, 89 international Arctic social scientists and indigenous representatives concluded in the *Arctic Human Development Report* (AHDR) that the quality of life of Arctic residents is not adequately described by the cash economy, formal education, and physical health (AHDR, 2004). They recommended that, in addition, the domains of cultural continuity, fate control, and contact with nature be included in any comprehensive description of the well-being of Arctic peoples. In keeping with this broader understanding of well-being, BOEM's Statement of Work (SOW) for the North Slope Social Indicator Study identifies six social indicator domains: economic well-being, education, health and safety, cultural continuity and well-being, local control, and the physical environment.

The goal of ASI has been to identify a small set of measures that collectively indicate the well-being of Arctic residents. ASI has involved over 50 Arctic social scientists and indigenous representatives. The ASI team reviewed and adopted the six domains recommended in the AHDR report. Members of the present study team (Larsen and Kruse) are active participants in the work of ASI and are aware of the immense intellectual investment represented in the recommendations of ASI. The six ASI domains closely parallel the six domains in the BOEM

SOW. This research plan is based on use of the BOEM domains. Comparable ASI domains are shown in parentheses:

1. Economic Well-being (Material Well-being)
2. Health and Safety (Health/Population)
3. Cultural Continuity (Cultural Well-being)
4. Local Control (Fate Control)
5. Physical Environment (Closeness to Nature)
6. Education (Education)

ASI has focused on the challenge of weighing alternative approaches to measurement within these six domains. ASI's discussion itself is of immense value as it represents the thinking of many of the Arctic's leading social scientists. The original premise of ASI was that it is possible to identify a small set of indicators covering all six domains based on existing data. ASI domain-specific teams discovered that it is extremely difficult to meet all data quality criteria using indicators based on existing data. In the first ASI report, *Arctic Social Indicators* (Larsen, Schweitzer, and Fondahl (eds), 2010), the following indicators were identified:

1. Infant Mortality (Health/Population domain)
2. Net-Migration (Health/Population and Material Well-being domains)
3. Consumption/Harvest of Local Foods (Closeness to Nature and Material Well-being domains)
4. Ratio of Students Successfully Completing Post-Secondary Education (Education domain)
5. Language Retention (Cultural Well-being domain)
6. Fate Control Index (Fate Control domain)

The ASI team concluded, however, that social indicators are largely unavailable (or not applicable) at a community level or are not collected at a frequency sufficient to detect change. ASI recommended the following objectives for further design and testing of a social indicator system:

1. Data are available at a regional level
2. Date are available separately for indigenous and non-indigenous populations
3. Data are available on at least a five-year reporting period.

The work of ASI is ongoing. The team will rely on Joan Larsen to ensure that the design of the social indicator system in this study is consistent with the conclusions of ASI. This study, in turn, will serve as a first order implementation of ASI social indicators.

Survey of Living Conditions in the Arctic

The Survey of Living Conditions in the Arctic (SLiCA) was conceived by Birger Poppel of Statistics Greenland as a method of measuring living conditions in Arctic communities that is relevant to life in the Arctic, as opposed to traditional methods applied in western Europe and the United States (Anderson and Poppel, 2002). SLiCA measures are obtained in a household survey. The social indicators adopted by SLiCA were the result of four years of work by an international team of Arctic social scientists and indigenous partners (Kruse et al., 2009). SLiCA has been implemented in Iñupiat settlement regions in Alaska (including the North Slope); Inuit settlement regions in Canada; Greenland; Sami settlement regions in Norway, Sweden, and the Kola Peninsula in Russia; and in Chukotka.

The SLiCA interview took an average of 90 minutes to complete. It produced 950 raw data variables. On March 21, 2007 the SLiCA team formally published a comprehensive release of SLiCA data (see www.arcticlivingconditions.org "Results"). This release consisted of 487 variables crosstabulated by country, region, and in many cases age and gender. SLiCA results have been published in 33 peer reviewed articles and have been the subject of 79 conference presentations.

Researchers working with SLiCA data, including Kruse who is Co-PI of this project, have learned much about the strengths and limitations of SLiCA measures. This knowledge can now be applied to a selection of key SLiCA measures. Inclusion of SLiCA measures in this study has three advantages: (1) the measures were originally selected by an international team of social scientists and indigenous partners; (2) we can assess the quality of each measure based on empirical evidence (over 8,000 interviews); and, (3) SLiCA measures included in the current study can be compared over at least a decade on the North Slope (2003 – 2013). It is possible to compare some SLiCA measures for the North Slope since 1977.

North Slope Social Impact Study

The North Slope Social Impact Study was funded by State of Alaska, Department of Community and Economic Development, Division of Community Advocacy under the National Petroleum Reserve –Alaska (NPR-A) Impact Program through a grant to the North Slope Borough. The Borough contracted with SRB&A to conduct the study, which was designed to document Barrow, Nuiqsut, Wainwright, and Atqasuk active harvesters' experiences and perceptions of impacts and benefits of oil and gas development (SRB&A, 2009). The study also included a comparative analysis of North Slope social indicator data for 1977 and 2003 and a comparative analysis of 2003 social indicator data for the North Slope with data for the Northwest Arctic and Bering Straits regions, and with Greenland, Chukotka, and the Inuit settlement regions of Canada. The study concluded that, as of 2003:

> On most measures, North Slope Iñupiat were as well or better off in 2003 than they were in 1977. North Slope Iñupiat, again on most measures, in 2003 were as well or better off than their Iñupiat neighbors in the Bering Straits and Northwest Arctic regions and as well or better off than the Inuit of northern Canada, the Inuit of Greenland, and the indigenous people of Chukotka (SRB&A, 2009: 165).

The social indicator comparisons over time and space suggest that, on balance, the benefits of oil and gas development on the North Slope as of 2003 outweighed the impacts. It is important to note that the benefits were indirect, resulting from the Iñupiat's successful initiative to form a regional government and tax energy development facilities.

Interviews with active harvesters in 2007 documented widespread personal experiences observed as impacts (and in two areas benefits) of oil and gas development. The study reported:

> The top ten categories among active hunter personal experiences in all four communities are shown in Table 4: "Difficulty Hunting" (68 percent), "Displacement of Wildlife" (60 percent), "Disruption of Wildlife (56 percent), "Contamination and Extraction of Materials" (53 percent), "Ability to Hunt" (47 percent), "Dividend Benefits" (48 percent), "Employment Benefits" (45 percent), "Effects of Development on Wildlife" (42 percent), "Social Impacts"

(40 percent), and "Decline in Wildlife Populations" (39 percent) (SRB&A 2009: 25).

The 2003 social indicator and 2007 impact results appear to be contradictory. One would expect that widespread personal experiences with impacts of oil and gas development would be reflected in comparatively lower social indicators on the North Slope. To understand these results, North Slope Social Impact Study researchers compared social indicator data for active harvesters in 2003 and 2007. They observed:

> The comparison shows a statistically significant decrease in satisfaction of over ten percentage points for three selected living conditions: influence of Iñupiat over management of natural resources like fish and game, influence of Iñupiat over reduction of environmental problems, and amount of fish and game available locally. There is also a statistically significant increase of over ten percentage points in satisfaction with local job opportunities. Finally, active hunters in 2007 have a mean depression index score that is significantly higher than that of active hunters in 2003 (SRB&A, 2009: 168).

Thirty-four percent of the impact experiences mentioned by active harvesters started after 2003. Taken together, these results suggest that cumulative onshore development impacts started to outweigh development benefits as reflected in declines of some social indicators between 2003 and 2007.

HYPOTHESES

As social indicator comparisons for the North Slope described above have shown, the Iñupiat-initiated regional government of the North Slope Borough has successfully turned tax revenues from oil and gas facilities into streams of benefits for North Slope Borough residents. The extent to which these benefit streams continue is dependent upon the facilities being located on state, borough, local, or private lands (i.e., not federal) and hence taxable by the North Slope Borough. Since offshore federal leases are likely to involve facilities not taxable by the Borough, the benefit stream of offshore development is likely to be smaller than that from a comparably sized development located on non-federal lands (or inshore waters).

As results of interviews with active harvesters in the North Slope Social Impact Study described above have shown, expanding onshore development activities have begun to interfere with subsistence activities, particularly with impacts on caribou hunting as a result of noise from helicopters, small aircraft, and seismic testing as well as pipelines not elevated sufficiently to allow easy passage of caribou or hunters, and the presence of outsiders in hunting areas. These impacts are subject to mitigation efforts. Offshore development is likely to increase air and marine traffic and expand the number of onshore pipelines. The extent to which offshore development increases the prevalence of subsistence impact experiences is dependent on the effectiveness of mitigation measures.

Offshore oil and gas development is viewed by Iñupiat as qualitatively different from onshore development. The National Research Council Committee on Cumulative Environmental Effects of Oil and Gas Activities on Alaska's North Slope concluded:

> *The 1983 observation of Kruse and colleagues, that Native Alaskans' "fears that offshore development will inevitably harm subsistence resources are both intense and widespread and themselves constitute an impact of development' is still true. The committee was repeatedly told that this is* ***the*** *issue for the Iñupiat." (emphasis in original)* (NRC, 2003:134).

Fear of the impacts of offshore development on subsistence will tend to lower North Slope social indicators even in the absence of realized impacts on subsistence.

The principal North Slope Social Indicator Study hypothesis is based on the above three observations: (1) the size of the benefit streams are dependent on the location of energy facilities on taxable land; (2) the disruption of subsistence activities is dependent on the effectiveness of mitigation measures; and, (3) fears of the effects of offshore development will tend to lower social indicators.

We can therefore state our principal hypothesis:

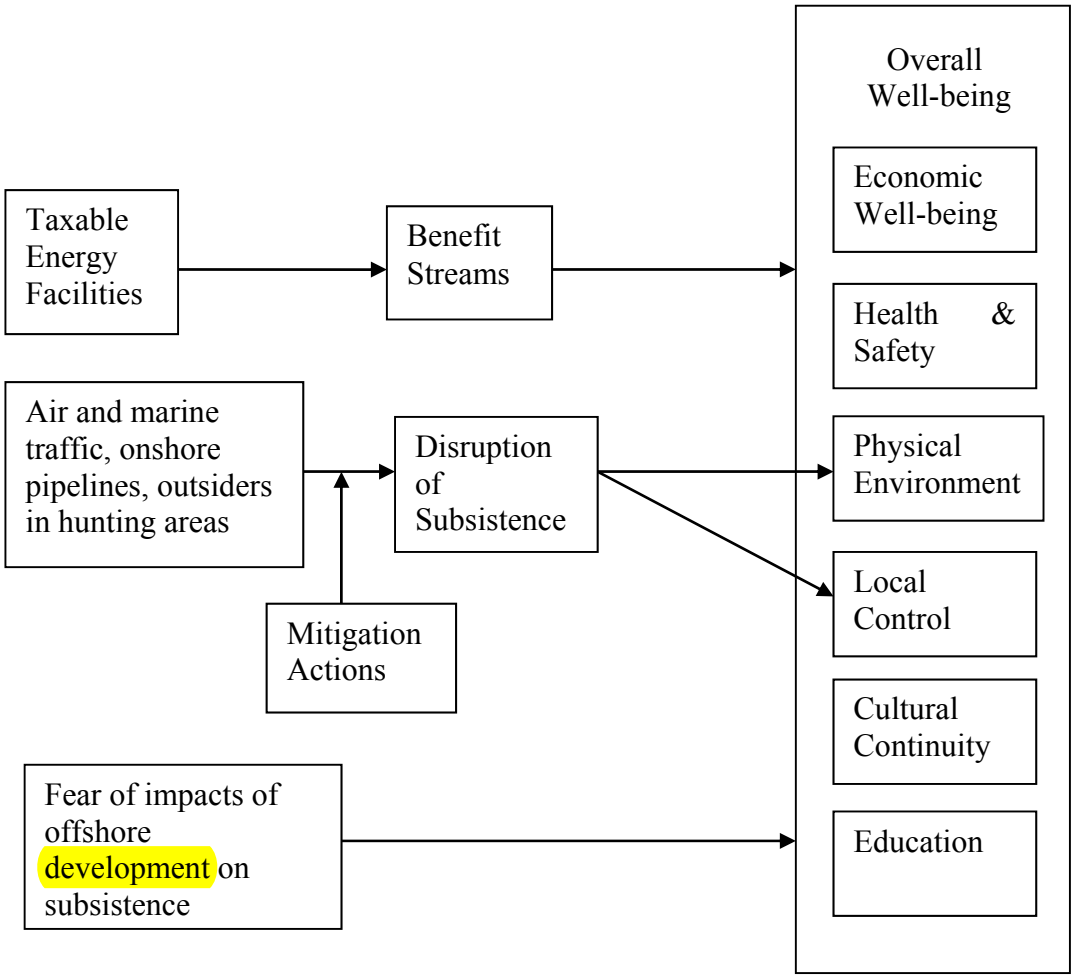
> The net effect of offshore development on the comprehensive array of social indicators is dependent on the multivariate effects of the size of the indirect benefit stream, the prevalence of unmitigated disruptions of subsistence, and the fear of future effects of offshore development on subsistence.

Figure 1 summarizes hypothesized relationships. Benefit streams are associated with all social indicator domains and hence overall well-being. Borough expenditures create jobs and housing opportunities (economic well-being); improve medical care and public safety (health & safety); protect subsistence hunting areas (physical environment); enhance local control; promote cultural continuity; and provide education opportunities. Disruption of subsistence likely increases the effort required for successful harvests (physical environment) and decreases a sense of local control. Fear of impacts of offshore development on subsistence likely decreases overall well-being with attendant effects on each social indicator domain.

Individual differences in experience with benefit streams, disruption of subsistence, and fears of impacts of offshore development on subsistence are likely to occur. Individuals residing in the same community are more likely to have similar experiences, hence community differences in social indicators are likely to be associated with differences in community exposure to offshore development activities.

Other BOEM studies underway will contribute to an understanding of changes in social indicators. The Nuiqsut Mitigation Study (Contract Number M09PC00034) being conducted by SRB&A for BOEM is tracking mitigation ideas and actions affecting Nuiqsut harvesters by development. Another BOEM project, COMIDA: Impact Monitoring for Offshore Subsistence Hunting (Contract No. M09PC00001), is documenting the offshore hunting activities of Point Lay and Wainwright harvesters and any impacts of development activities. The Mitigation and COMIDA study designs could be implemented for other communities.

Figure 1: Summary of Hypothesized Relationships



RESEARCH TASKS

The project plan consists of nine tasks identified by BOEM and various subtasks identified by the study team. An outline of the tasks, subtasks, and schedule by which these tasks and subtasks are to be completed, are depicted in Table 1a and 1b. The following is a description of each task in addition to the proposed methods, including analytical methods, for each task.

Task 1: Formulate Research Design

This document.

Task 2: Community Engagement

A model for the involvement of local residents is the Alaska Native Management Board (ANMB) in the SLiCA study (Kruse et al., 2009). Prior to starting SLiCA in Alaska, the research team invited representatives of the three Iñupiat settlement regions to form an oversight board, the ANMB. Over the course of the study, the ANMB reviewed and gave final approval (prior to Institutional Review Board approval) for research design and questionnaire protocols, reviewed preliminary tabulations, and reviewed pre-publication articles. The arrangement explicitly transferred decision making authorities from the researchers to the ANMB (applied to this RFP, ANMB decisions would be prior to decisions made by BOEM and OMB). There were explicit guidelines to handle cases of disagreement between the researchers and the ANMB on the content of publications. Members of the ANMB became active participants in the research design in SLiCA and worked with the research team on difficult decisions on how to balance concerns about the sensitivity of certain questions with study objectives. The ANMB was an integral part of the study team.

To meet the challenge of producing social indicators that are viewed as relevant and reliable by region residents the study team proposes to invite representatives from each of the six communities as well as regional organization representatives from the North Slope Borough, such as the Borough, the Iñupiat Community of the Arctic Slope (ICAS), and Alaska Eskimo Whaling Commission (AEWC). The team would propose the ANMB model as a starting point for designing the role of the North Slope Management Board (NSMB). BOEM and OMB approvals would be based on protocols approved by the NSMB.

Depending on the invitees' willingness to participate, the research design will include the formation of the NSMB which will invite participation from representatives from each of the six communities as well as regional organization representatives from the North Slope Borough, ICAS and AEWC. The NSMB will be involved in all phases of the study as described below. SLiCA's approach to community engagement is based on the recognition that researchers bring to the project funding and technical expertise. These resources create an unequal power relationship. By explicitly establishing a community-based decision authority in the project the power relationship is more equal. Applying this approach in SLiCA resulted in a strong community engagement and improvement in the study design and implementation (Kruse et al., 2009).

Table 1a: Research Tasks and Schedule: Base Year

Task	Task Name	Deliverable
	Post Award Meeting and Summary	Summary of meeting (F.4.2.1.1)
C.5.1	Formulate Research Design	A. Research Design (F.4.2.2.1)
C.5.2	Community Engagement	B. Community Engagement Protocol (F.4.2.2.3)
C.5.3	Literature Search and Review	C. Literature Summary (F.4.2.2.4)
C.5.4b	Provide Alternative or Additional Domains and Social Indicators	E. Provide Alternate or Additional Domains and Social Indicators (F.4.2.2.5)
	Status meeting	F. Post Status Meeting Report (F.4.2.1.2)
C.5.5	Formulate Survey Instrument	G. Draft Survey in Word (F.4.2.2.6)
C.5.5a		H. Draft Federal Register Subject Statement (F.4.2.2.8)
C.5.5.b	Pre-test instrument	I: Survey Pre-test Report (F.4.2.2.7)
C.5.5.c	OMB Survey Application Package	J: Complete OMB Survey Application Package (F.4.2.2.10)

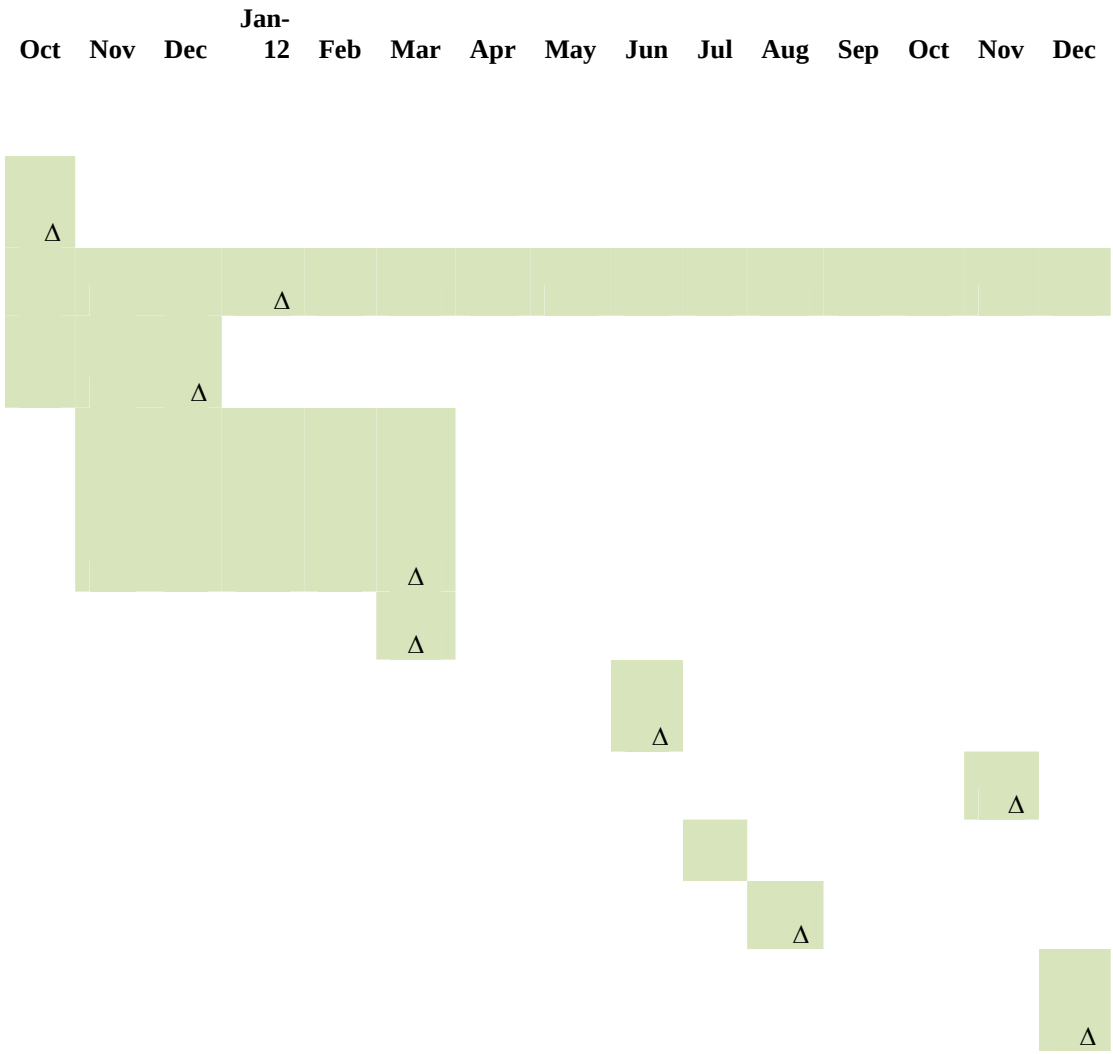


Table 2b: Research Tasks and Schedule: Option Year

Task	Task Name	Deliverable	Option Period Month 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
C.5.6	Conduct Survey																		
C.5.7	Data Management Report and aggregated data	K: Data Management Report and aggregated data (F.4.2.2.11)												Δ					
C.5.8.a	Draft Table of Contents, Draft Chapter, Draft Report and Technical Summary	N: Draft Report and Technical Summary (F.4.2.2.12)															Δ		
C.5.8b		O: Contractor Response to MMS Comments on Draft Report																	
C.5.8.b	Submit Final Report and Technical Summary	P: Final Report and Technical Summary (F.4.2.2.13)																	
C.5.8.d	Submission of Draft Journal Article	M: Draft Journal Article (F.4.2.2.13)																	
	Submission of Journal Article	Q: Submission of Journal Article																	
	Submission of Translated Summary Public Report	(F.4.2.2.15)																	
C.5.8.c	Present Major Findings	S: Presentation of Findings (F.4.2.2.16)																	
	Quarterly Progress Reports	T: Quarterly Progress Report (F.4.2.2.2)	Δ				Δ				Δ				Δ				Δ

In addition to the formation of and coordination with the NSMB, the study team will work with the North Slope Borough mayor's office and each of the six community city councils and/or tribal organizations to obtain permission to conduct interviews in the community. The process of community engagement will follow the successful SLiCA model of written letters requesting permission to conduct interviews, written descriptions of the study, follow-up telephone contacts, a community visit if requested by the council, and meeting with council members prior to interviewing, followed by review and discussion of preliminary results with the community.

The study team will apply the SLiCA experience to involve communities during interviewing and at the time of community review of preliminary results. Members of the SLiCA study team talked about the study on KBRW radio and through local programs such as the SchoolYard Project of the Barrow Arctic Science Consortium. The SLiCA model also included a Data Release Workshop in which stakeholders and the research team discussed study findings. The study team will try to coordinate research activities with the Barrow Arctic Science Consortium for use of their facilities.

Another dimension of community engagement is the involvement of North Slope residents in the interview process. The SLiCA approach was to use a combination of team leaders, local liaisons and local interviewers. Team leaders were experienced interviewers. Local liaisons were community residents who were trained to set up interviews, guide team leaders, and serve as translators as necessary. Interviewers were local liaisons who received additional classroom and on-the-job training. It is important to note that there is a tradeoff between maintaining confidentiality and involvement of local residents as interviewers. In the SLiCA model, North Slope residents served as interviewers in Barrow. In the villages, only North Slope residents living in another community interviewed. For the North Slope Social Indicator Study, the team will hire local liaisons to work with experienced interviewers to help arrange interviews.

Task 3: Literature Search and Review

Members of the research team have conducted reviews of the literature relevant to the development of social indicators in the Arctic. A 455 record database of relevant literature is a product of this review. Relevant to the BOEM goal of understanding the current state of knowledge about key social indicators are articles written by the SLiCA team including Usher, Duhaime, and Searles (2003); and Anderson and Poppel (2002). The research team will update the database, annotating key articles. The team will prepare a written summary, building on the syntheses already prepared in SLiCA and ASI.

Task 4: Develop Social Indicator Domains and Alternatives

As discussed under the Theoretical Framework section, each of the domains used by BOEM matches or closely parallels one of the domains adopted by Arctic Social Indicators. The ASI process of reviewing and confirming the six domains is itself a strong statement of the validity of the domains. A departure from these domains (or the BOEM version of them) would only detract from the validity already established.

The team can therefore focus on the selection of social indicators within each of the six existing domains. The team will use a two step process for selecting indicators. The first step, **Eligibility Assessment**, is directly based, with modifications discussed below, on the three ASI social indicator objectives noted above:

1. Data are available at a regional level
2. Date are available separately for indigenous and non-indigenous populations
3. Data are available on at least a five-year reporting period.

The first objective, data available at a regional level, requires additional precision to meet the BOEM analytic objective of differentiating offshore development effects from other forces for change. As specified in the SOW, the BOEM Arctic Social Indicator system requires data to be available at the community level. Availability of data on at least a five-year reporting period is taken to mean that either existing data is collected at an interval of five years or less, or that measures based on primary data collection could be repeated on at least a five-year interval. For the North Slope Social Indicator study, to be eligible for assessment as a social indicator:

1. Data must be available at a community level
2. Date are available separately for indigenous and non-indigenous populations
3. Data are available or could be collected on at least a five-year reporting period.

Social indicators, as treated by ASI and in the AHDR, are to be "used in tracking changes in key elements of human development in the Arctic over time" (AHDR, 2004:242 and ASI, 2010:23). In its conclusion, ASI states: "The long range goal of devising Arctic social indicators is to design and move towards the implementation of a system for monitoring changes in human development in the Arctic and to further our understanding of living conditions within this region" (ASI, 2010:147). During the ASI process the terms "human development" and "living conditions" were used interchangeably to refer to characteristics of people important to describing their well-being. "Social indicators" are measures of these characteristics.

Confusion can arise in describing what constitutes a characteristic "important to describing well-being." Physical health is an example of a characteristic readily associated with a person's well-being. Years of formal schooling is an example of a commonly used social indicator that, while directly contributing to a person's well-being, is important as a resource used by a person to make choices (like obtaining a job) that lead to an increase in well-being. The field of social indicators recognizes the importance of measuring such resources (Ringen, 1995).

Less central to the concept of individual well-being are, for example, measures of government expenditures. Increased government expenditures for public safety may indicate more resources becoming available for a given level of threats to public safety. Alternatively, increased public safety expenditures may reflect an increased demand due to an increase in threats to public safety. Government expenditures above the community level are clearly ineligible. The team will examine the extent to which existing data at the community level may be eligible for assessment as key social indicators. Included in this examination will be data from the American Community Survey (ACS).

The second step in social indicator selection, **Indicator Assessment**, will be the application of the BOEM SOW criteria:

1. (Utility) Relevant and important to describing living conditions by stakeholders, decision makers, and social scientists; preferably data for the same measure are available for previous time periods and comparative populations.
2. (Validity) Represents a living conditions *outcome* (e.g. income, health), or a *resource* (e.g. education, healthy physical environment) important to an individual's living conditions.

3. (Reliability) Yields consistent results on repeated application of the measure when there is no significant change in living conditions and reflects real change when a significant change occurs.
4. (Precision) Sensitive to changes on an annual scale (e.g. annual harvest) but not to changes on a monthly scale (e.g. harvest only in December).
5. (Feasibility) Available from existing data, easily generated from existing data, or obtainable from interviews based on the knowledge of the respondent.
6. (Applicability) Separately reported for indigenous and non-indigenous households at a community level.

The research team will complete the Eligibility Assessment and the Indicator Assessment focusing on four sources of indicators: (1) ASI; (2) SLiCA; (3) ACS; and, (4) NSB expenditures and program statistics (to the extent they represent resources available to households at the community level). Based on the Indicator Assessment, the team will identify key indicators by domain. The team will then identify key indicator gaps and recommend household survey measures to fill these gaps. The results of this work will then be brought to the NSMB for review.

Task 5: Survey Design and Approval

The design of the North Slope Social Indicators Questionnaire will be based on the results of the social indicator development process described under Task 4 and will also be informed by the theoretical framework developed under Task 1. Survey design principals are based on the Survey Research Center (SRC) of the Institute for Social Research at the University of Michigan. These principals have been developed over 60 years of experience at the SRC and over 30 years of experience of application in Alaska. Special consideration will be given to the strict OMB requirement that every question can be justified according to legal mandates.

Survey design includes pretesting, sample design, fieldwork design, and data processing design in addition to questionnaire design. Pretesting will occur, following Contracting Officer's Representative (COR) approval of the draft questionnaire, with the restriction that any one question will be asked of nine or fewer individuals. The team views pretesting as a critical step in the development of a final questionnaire and will test multiple versions. The proposal team is experienced in multi-stage probability sample designs as evidenced in SLiCA. The desired sample sizes are calculated according to the following parameters: design effect, proportion being estimated, response rate, desired coefficient of variation, and number of households. The team notes BOEM's suggestion (RFP p.12) that "Given the small size of prospective communities, the survey effort shall strive for universal coverage of all resident households." BOEM originally used this language to describe five North Aleutian communities that, according to the 2010 census, have approximately 75% fewer households than the six North Slope communities. The team questions a 100% sample of the approximately 2,000 households in the six North Slope study communities. The team is happy to discuss alternative sample designs with BOEM in order to optimize the combination of monitoring objectives and response burden. Using the SLiCA approach, an adult would be randomly sampled within each sampled household. Each community sample will be based on a 100 percent listing of occupied households. The team notes that an important component of OMB approval is a research design with high likelihood of achieving a response rate of at least 75 percent. The SLiCA fieldwork

design used as a basis for this project yielded a response rate in the three Iñupiat regions of Alaska for 84 percent.

The fieldwork design is based on formal training of interviewers using a training manual, multi-day classroom training and practice interviews. The team will hire local liaisons to work with experienced interviewers to help arrange interviews. In this way local residents will not be placed in a position of violating the confidentiality of interviewers by interviewing their neighbors. Interview edits will be done following interviews by interviewers and with checks by the field director. Coding and data entry will be performed using the Statistical Package for the Social Sciences (SPSS).

The study team will provide a draft survey instrument to BOEM for review prior to pretesting. After pretesting, the study team will provide a report summarizing the results of pre-test activities. Based on the comments from BOEM and any necessary revisions based on pretest results, the study team will meet with the NSMB to discuss any revisions. The study team will then finalize the survey instrument and submit the survey instrument and associated application materials to BOEM for submission to the OMB. We note that in prior submissions to OMB, members of the study team met with OMB representatives as part of the OMB review process.

Task 6: Administer Survey Instrument

The design of the fieldwork and data entry phase is described under Task 5 as each of these steps is part of the package approved by OMB. The timing of survey administration will take into account factors affecting the response rate. Since the validity of survey results is directly related to the response rate, it will be important to time the survey to a period when selected respondents are home and not engaged in peak time employment, subsistence, or cultural activities. Normally the best time for administration of a survey in North Slope communities is in January and February. The appropriate timing for the surveys will be determined through coordination with each community.

Surveys are most efficient when conducted in a short time period, usually four to six weeks. Travel to villages is expensive and best limited to one survey wave per village. However, unanticipated events (e.g., death in the village) can jeopardize the response rate unless additional visits to the village are conducted. The team understands that the desired focus is on household indicators. Increasingly, village households are smaller units such that a household often consists of one or two adults and possibly children. It is important, however, to consider gender-based differences in both positive and negative effects and differences in age-cohort effects (e.g., young adults as compared with middle-aged adults, and older adults). The SLiCA approach used to deal with such challenges was to select a knowledgeable adult for household-level indicators and to randomly select an adult 18 years old or older as for individual-level indicator responses. The team will discuss this alternative with the NSMB and with BOEM.

All survey data will be entered in SPSS with each record consisting of the response of a single household. Each survey record will be associated with a weight variable that corresponds to the inverse of the statistical probability of selection. In addition to the household and individual characteristics associated with each record, community attributes will be attached.

Task 7: Analyze Data

The team proposes to build on the SLiCA analysis experience. After coding, data entry, and data cleaning, the SLiCA team held a day-long workshop in Kotzebue with the ANMB to review preliminary results. The team included a member of the Canadian Inuit Reference Group from the Labrador Inuit Association in the Kotzebue workshop. This type of review was repeated in other countries. In another international workshop held in Murmansk, members of the Alaska and Canada review boards were asked to come up with major analysis questions. These analysis questions proved to be the central themes guiding the analysis (Kruse et al., 2009). The theme analysis results were presented to peers at the 2006 Conference of the International Society for Quality of Life Studies (ISQOLS) in both workshop and plenary settings. Two papers presenting SLiCA results were subsequently accepted for publication in peer reviewed ISQOLS volumes. We propose to adopt the same approach of NSMB preliminary review of tabulations and suggestions of analysis themes based on the hypothesized relationships between oil and gas development and living conditions on the North Slope.

The analysis themes suggested by the ANMB in SLiCA required multivariate analysis techniques. The research team found that ANMB members were adept at understanding these results. This understanding is important to the review of pre-publication drafts.

Task 8: Prepare Draft and Final Deliverables

Following data analysis, the study team will begin preparation of the draft report and final deliverables. This will include submission of a draft Table of Contents and a draft chapter for BOEM review prior to submitting a draft report and technical summary. The draft report will include sections on study goals and objectives, study methods (e.g., methods of data collection and analysis), problems encountered, and results. In addition to presenting the results of the North Slope Social Indicators Study, the report will use the results of the study to address the potential for linkages between oil and gas development, other socioeconomic conditions, and social well-being. The team will ask the NSMB to review this draft and discuss it in a workshop with the study team. Following any revisions made on the basis of the workshop, the team will submit the report to BOEM for review. The study team will edit the draft report based on the comments received from BOEM and, following any necessary dispute resolution, will submit a final report and technical summary, both in hardcopy and on CDs. During preparation of the draft report, the study team will submit an article presenting the major findings of the study to a peer-reviewed journal for publication. This article will also be provided to BOEM and the NSMB for review prior to submission.

After final submission of the report and technical summary, the study team will present the study findings to the appropriate organizations in each community and will prepare a public summary report. The study team will also present their findings at the Marine Sciences Conference in Anchorage.

Task 9: Project Management

Stephen R. Braund of SRB&A will be the project manager for the study and will be the point of contact between the study team and BOEM. Braund will be actively involved in project design and administration, will be present for all study meetings (including the kick off meeting with BOEM), and will oversee submission of progress reports and all other required deliverables to BOEM.

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