Social Impact Assessment and Offshore Oil and Gas in the Gulf of Mexico

Harry Luton, Ph.D., Minerals Management Service
Rodney E. Cluck, Ph.D., Minerals Management Service

ABSTRACT

This paper discusses social impacts of offshore oil and gas development on human communities in the Gulf of Mexico. It addresses issues that arose as Minerals Management Service followed the National Research Council's rationale in applying social impact assessment to the Gulf's offshore petroleum industry. The first section discusses the "classic SIA model," the original boomtown model that established the underlying issues, questions and logic that shape most energy-related socioeconomic assessments. We show that project-induced demographic change drives the entire model. The second section describes significant differences between classic model assumptions and the actual demographic consequences of the Gulf's oil industry. The third section returns to the classic model and concludes that none of its basic assumptions fit Gulf of Mexico realities and that the model is incapable of addressing situations with the magnitude, longevity or complexity of that faced by social impact assessment in the Gulf..

Introduction

In the Gulf of Mexico, the offshore petroleum industry is huge. There are approximately 4,000 structures including 3,800 active platforms on the Federal Outer Continental Shelf (OCS) that are responsible for 25% of the gas and 30% of the oil that is produced in the United States. Those percentages are expected to rise over the next few years. There are more than 25,000 miles of pipeline on the Federal OCS. There has been approximately 1.6 million miles of seismic lines taken, there are over 3.5 million passenger trips to and from platforms every year. Since 1952, there have been over 100 lease sales on the Federal OCS and there are currently over 7,000 active leases. It is the second largest revenue source for the Federal treasury after the Internal Revenue Service. The treasury receives approximately $4.3 billion annually from bonuses, rents, and royalties from the OCS program (see Figure 1).

Figure 1 about here

The Minerals Management Service (MMS) was founded in 1982 by joining together several government organizations overseeing OCS activities and it was charged with leasing offshore petroleum reserves on the Federal OCS in an environmentally safe manner. One part of the new organization was the Environmental Studies Program (ESP), originally created under the Bureau of Land Management (BLM) to provide information and analysis to support agency decisionmaking and environmental assessments as mandated by the National Environmental Policy Act (NEPA). The ESP funds a substantial quantity of research designed to improve the information on which decisions and assessments are made. Since 1982, MMS has invested over $650 million on over 900 studies in the areas of oceanography, ecology, and socioeconomics. However, when the BLM first initiated the ESP, little socioeconomic research was conducted in the Gulf. NEPA defines effects as the differences between an area's baseline conditions and the conditions after project initiation. Pointing to oil's long history in the Gulf, the BLM reasoned that the additional impacts of offshore development in an already firmly established oil development region would be difficult to identify by means of NEPA baseline-monitoring techniques. As a result, few socioeconomic studies were initiated in the Gulf despite the fact that virtually all U.S. offshore oil development was occurring in that region.

At first, MMS continued a narrow reading of NEPA begun under the BLM that resulted in little ESP-sponsored socioeconomic research in the Gulf of Mexico. Then, in 1986, petroleum prices collapsed, sending Louisiana and Texas into recession and convincing many that the socioeconomic effects of MMS leasing program were important regardless of any reading of NEPA. In the 1990's, MMS contracted with the National Research Council (NRC) to examine the adequacy of ESP support for agency decisionmaking and assessments. The NRC was highly critical of the socioeconomic component of the Gulf's ESP, and asserted a strong rationale for future research in this area. It noted that the 100-year history of industry operations in the Gulf, which had been used to justify undertaking little socioeconomic research, makes the Gulf a ready-made "laboratory" for studying petroleum's social and economic effects (NRC 1992). The NRC reasoned that, because the Gulf offshore industry is homegrown, long-lived, widespread, and includes a complete range of related upstream and downstream activities, most social or economic impacts that the industry can have are likely to have already occurred there. At the same time that the NRC was issuing its report, the MMS was sponsoring the "Gulf of Mexico Socioeconomic Agenda Setting Workshop." The price-collapse being experienced by the oil industry provided the impetus for the program, and the NRC provided its justification. So, in 1992, the workshop began to define its content (Gramling and Laska 1993).

Since 1992, the socioeconomic component of the Gulf's ESP has grown substantially in size and

scope. Over 35 research reports have been completed. About 25 research projects are ongoing, 4 will begin in 2003, and more are planned for the future. This paper, however, does not describe the program's growth or content. Instead, it addresses issues that arose as MMS followed the NRC rationale and applied social impact assessment (SIA) logic to the Gulf's offshore oil industry. [1] This paper is divided into four sections. The first discusses what we term the "classic SIA paradigm," the underlying issues, questions and logic that shape most energy-related socioeconomic assessments including MMS's. The second uses demography to illustrate differences between the paradigm and the Gulf. What we say may not be new (e.g., Wilkinson et al. 1982; Gramling and Brabant 1986), but the Gulf provides a fresh perspective. The third section describes a larger set of problems associated with applying the classic SIA paradigm to the Gulf. The paper concludes with a few comments on where MMS might go from here. This is a work in progress and far from a solution.

Classic SIA

SIA has evolved in many directions over the years. However, we label as "classic SIA" the model that emerged from a group of impact studies conducted in the 1970s and early 1980s that addressed large, government-sponsored projects such as coal-fired generating plants, strip mines, and hydroelectric dams, mostly in rural areas of the western United States (Murdock, et al. 1984). This model is often referred to as the boomtown model but we label it as classic because it was the first SIA model, the root from which the field's later branches sprang, and because it established an underlying logic, defined a set of goals, and identified a list of concerns that still echoes in the branches of SIA that have since emerged. It is also classic because of its longevity; after 20 years it is still a frequently used approach and predominates in the area of energy-related assessments. As such, it is the approach on which MMS began to build its assessments of the social and economic effects of the OCS leasing program.

As is often noted, this SIA model reflects the conditions from which it emerged, most notably concerns about "boomtowns" (Wilkinson, et al. 1982; Albrecht 1982). As contemporary reviewers wrote, studies of Gillette and Rock Springs, Wyoming, and then of Forsyth and Colstrip, Montana; Craig, Colorado; Page, Arizona; and Fairbanks, Alaska, "rejuvenated" interest in boomtowns. The basic theme of this literature, they continue, "is that rapid population growth associated with energy development creates social disruptions, cultural conflict, and pathological behaviors among residents of boomtowns" (Summers and Branch 1982:34-35). These community studies, and others that followed, expressed a deep concern for a way of life being forever-altered--they asked, "whatever happened to Fairbanks?" They raised issues about local control, about townspeople having little say regarding new forms of industry appearing "on their village green," (Summers and Selvik 1982:vii), about the rural towns being made "dependent on extra-local decision-making organizations," about social change and the idea that mineral exploitation introduces new organizational forms which demand changes to the existing social organization, about land-use conflicts and competition for scarce water, about the benefits and uncertainties created for local businesses, about new demands on public infrastructure and services, and about taxes and fiscal policy. They raised issues about large, but short-lived labor demand, about the inflow of workers not rooted in the community, and about increasing crime, alcoholism, drug abuse, mental illness, divorce, social isolation, and alienation (Summers and Branch 1982:24-25, 28-29).

The Classic Equation: Jobs = People = Effects

[1] For information about the Gulf ESP see: http://www.gomr.mms.gov/homepg/regulate/environ/studiesprogram.html. This site contains information on the Gulf Region ongoing studies, completed studies from 1993 to the present, and Annual Studies Plan. It also includes pdf files of many of the more recent study reports.

While concern about the uniqueness of communities energized these early impact studies, the recognition of shared characteristics and situations shaped the SIA model. Large, managerially complex, technologically sophisticated, industrial projects designed to exploit a natural resource were constructed near small, rural, isolated, homogeneous, often declining, agriculture-based communities. Project-related decisionmaking was external to the community and foreign to its systems of leadership or governance. Project-related technology, goods and service needs, and labor demands were well beyond the community's capacity to supply. Projects were, essentially, foreign transplants that would exist for a limited time period that was further divided into three distinct phases. A short-lived construction phase with high levels of employment and heavy demands on the community, its infrastructure and leadership was followed by a longer operations phase that used fewer, more specialized workers and made lighter, more constant demands. The final phase, decommissioning, brought the project to its inevitable close.

In the classic SIA model, new project labor demand is the primary cause of positive and negative socioeconomic impacts. New jobs increase household income and expenditures, which stimulate local business activity and generate more government revenue through taxes and fees. While higher labor demand always means positive economic effects, the model's strength comes from locating these benefits in their rural context. Because these communities are small and agricultural and the projects are large, industrial and foreign most of the new jobs cannot be filled by the local labor force, and, because these communities are far from any population centers, new jobs will not be filled by commuters already living nearby. New workers must come from elsewhere. This means that inserting large projects into rural communities will cause rapid population growth as outsiders arrive seeking work. Other factors amplify this process. Rural environs compress the new population in space because services like water, electricity, and schools are found only in towns, limiting where inmigrants might live. In addition, the short lifespan of the projects and, especially, of their construction phase, compress the new population in time. These communities will experience rapid population growth because new labor is drawn from elsewhere and demand is front-loaded. For the same reasons, these communities will also face rapid population decline. Construction workers who inmigrate will outmigrate when their jobs end, although operations-phase employment may slow this decline. Again, other factors accentuate the ups and downs. Many workers arrive with families, inflating the new population's size and diversity. Since the new households stimulate local business growth, local businesses may also outrun their local labor supply creating additional inmigration. These jobs, too, will be lost as the project-related population decreases.

An emphasis on links between rapid population change and other effects, such as the fate of local business, is a characteristic of this model that recapitulates its boomtown genesis. While demographic change concentrated in time and space would be an important impact in its own right, in the classic SIA model it is fundamental: it is the first and most germane cause of a wide range of other socioeconomic effects and it is the point where impact theory, assessment practice, and the original boomtown concerns all meet. As one pioneer practitioner warns, "determining demographic effects of project development is one of the most important steps in the socioeconomic assessment process because estimating demographic impacts is essential for assessing other population-related effects such as public service demands and fiscal impacts. In fact, too many planners and decisionmakers assume the magnitude of population impacts is synonymous with the magnitude of all impacts" (Leistritz 1992:212).

Consequences and Their Causes

The classic SIA model addresses several categories of impacts. Demographic effects come first, as

products of new labor demand. Economic impacts come second, as products labor demand and the demographic effects. As already noted, economic impacts amplify the demographic effects (e.g., via secondary or tertiary demand). Infrastructure and public service effects come next. These can include new demands for private and public housing, and for infrastructure and services associated with education, police, fire and emergency services, transportation, water, sewer and sanitation, health and social services, criminal justice, recreation, and libraries. In classic SIA, these effects are due primarily to demographic changes, although some interactions are seen as more complicated. For example, rapid inmigration may create housing booms that increase the tax base along with demands for roads, schools, and police protection. Conversely, the bust brings empty housing, a shrinking tax base, overbuilt schools, and lingering bonded indebtedness.

The housing example raises a fourth category, fiscal impacts. Fiscal impacts are products of project activities, labor demand, and demographic effects. On the positive side, these impacts include increased local revenues (e.g., fees and property and sales taxes). On the negative side, they include increased expenditures to meet new infrastructure and public service demands. Again, this focus on housing, public infrastructure, roads, schools, social services, and public safety parallels concerns endemic to boomtown literature, concerns that also shape classic SIA's basic instrumental goals. Both boomtown literature and the SIA model share the concern that the community and its leadership might be overwhelmed by its swelling population and burdened afterwards by an overoptimistic response to it. For this reason, the goal of classic SIA is to produce assessments akin to city planning documents that can be used by affected communities to balance responses to the opportunities and difficulties of the economic boom against the realities of the inevitable bust.

The last category generally addressed is social and cultural impacts, which includes such topics as the distribution of effects within the community (e.g., who benefits and who is burdened), impacts to specific populations (e.g., effects of inflation on the elderly, the alienation of youth, the isolation of trailer park life), community cohesion or identification, effects on crime and other dysfunctional behaviors (both actual rates and fear), and effects on environmental attitudes. While some effects in this category may be positive, such as the introduction of new ideas or the increase of what Summers and Branch (1984:39) call "perceived freedom," most of them are negative. Social and cultural impacts is actually a residual category comprised of a variety of topics that share few methodological or subject-area similarities, and that are sometimes considered in an assessment and sometimes not. However, these topics do share one commonality; none fit easily into other classic SIA impact categories because each has a complex and, often, unclear or uncertain relationship to demographic change, a defining characteristic of the other impact categories.[2]

The fact that central boomtown issues, even ones that remain public concerns, are relegated to a residual category underscores the importance of demographics in defining classic SIA's relevant questions, information, and procedures. However, it also shows the influence that the model's boomtown origins continue to exert from within. The topic of crime is a case in point. While violent crime is a *cause célèbre* in boomtown literature, its validity as a contemporary impact has been argued for decades. The debate's very robustness in the face of inconclusive evidence and its marginal place in the assessment process may indicate the enduring force of boomtown concerns. More telling, though, is its invocation of Durkheim and anomie, the concept he coined to address social phenomena appearing as a rural peasants tied to their birthplace where being uprooted into cities that had yet to

[2] Environmental Justice is the exception that proves the rule. It is a more narrowly defined version of the NEPA issue of who benefits and who is burdened. While the assessment of this general question of the distribution of benefits remains inconsistent, under Executive Order 12898 (59 FR 7629) federal agencies are required to identify any disproportionate impacts of its activities on minority or low-income populations. Therefore, Environmental Justice regularly appears as a separate category of effects.

develop modern structures of social control. In the 100 years since Durkheim's *Suicide*, criminologists have developed explanations of crime rates that are simpler and more directly related to what is known about crime and criminals. Anomie's charm lies not in its simplicity, or elegance, or empirical might but, rather, in its recourse to the organic community and its breakdown, and to the disorder that must surly follow, and to our gnawing concerns about boomtowns and the worlds we have lost (Summers and Branch 1982; Wilkenson et al. 1982).

Classic SIA as Paradigm

We have labeled the boomtown model as classic SIA because it is the root from which other approaches have sprung. It also fits Thomas Kuhn's famous formulation of a paradigm. Kuhn (1970:10) describes scientific paradigms as models that organize "law, theory, application and instrumentation" into "coherent traditions of scientific research." We identify the classic SIA model as paradigmatic to underscore its importance in shaping theory, application and technique into a coherent tradition of scientific research. We have already discussed its role in organizing a theory of effects, the practices and goals of assessment, and boomtown concerns around the demographic impacts of a project's labor demand. We have also noted that the model defines assessment's salient questions, hence, the salient evidence. The hierarchy of impact categories shaped by their relationships to demography is one example; the issues surrounding criminal behavior is another. Definitions of salience push inquiry in some directions and not others. Studies focus on population-induced demand and, in passing, note that petroleum's big infrastructure effect in North Dakota was road wear from truck traffic (Chase and Leistritz 1982). Studies assume a nexus between social disruption and fear of crime, most evident in women, and fail to note a sizable body of literature on the macho, male-centered culture of oil drillers (e.g., Affleck and Eakes 1976; Moen 1986). Finally, we note that, as in Kuhn's definition of paradigm, this model has shaped SIA's instrumentation. For example, the development of regional input-output (I/O) models is one of the notable achievements under classic SIA (Jones, et al. 1988). These I/O models tend to be "static," they assume that the relationships among various economic sectors are constants. Such an assumption fits perfectly with a small, rural, agricultural economy incapable of adjusting to the demands of a massive and short-lived project. It is much less appropriate when local labor and enterprises can and do respond to new demands.

We also raise the issue of classic SIA as paradigm to emphasize the large shadow it casts on the field of SIA generally—a wide-ranging but variable influence that is manifested, for example, in the impact categories addressed and their processional order, in an emphasis on demographic effects whatever their magnitude, in the ad hoc and residual character of social and cultural effects, in the use of fear and anomie, in the dearth of causal explanations generally except those rooted in demography or subjectivity, and in the focus on projects and the early phases of projects. However, whether or not one accepts such family resemblances as evidence of the classic model's continuing influence on more recent iterations of SIA, it does still dominate the assessment of natural resource extraction and energy projects and it has certainly shaped Gulf Region socioeconomic analysis. We will note several of the many examples of its influence from MMS-sponsored research. First, demography tends to be emphasized even when there are virtually no population effects. The Mobile, Alabama, area hosts a large population and complex economy, the kind of context in which many of the OCS program's effects occur. An excellent study of its offshore gas industry carefully reports the industry's annual demographic impacts to the tenth of a person even though the numbers are only artifacts of an economic projection unrelated to any actual data, and even though the projected inmigration was inconsequential (Wade et al. 1999). Second, an analysis of the rapid growth of offshore support activity at Port Fourchon was delayed as its author searched in vain for demographic effects that he simply knew must be there but were not (Hughes et al. 2001). Third, analysis sometimes directly equates demographic impacts with social ones. Not heeding Leistritz's warning, a MMS study of the

social costs of the 5-Year OCS Leasing Program argues that, since the program has no population effects, it has no infrastructure costs (Plater and Wade 2000). These are all subtitle examples of the influence of the classic model. A spate of research funding by MMS immediately after the oil price collapse used the boom and bust assumptions explicitly (e.g., Laska et al. (eds.) 1993; Seydlitz and Laska (eds.) 1994).

Demographics, Offshore Oil, and Classic SIA

The classic approach to SIA grew out of rural American's sudden introduction to large, new, energy projects. This approach morphed concerns about small towns and boomtowns into a systematic analysis of socioeconomic impacts. We do not question the model's validity for similar situations. However, like any paradigm, it is a very strong lens that throws the world into a particular focus. The question is whether this focus is appropriate for viewing the OCS program's social and economic effects in the Gulf of Mexico. We have examined the demographic assumptions that lie at the heart of the classic model. Here, we look at the petroleum industry's demographic effects on Louisiana, emphasizing the period of the 1960's through 1980's, to show that actual effects differ markedly from its paradigmatic assumptions. From early on, the demography of south Louisiana petroleum-affected communities exhibited a pattern of stability and geographic differentiation that is unlike the up and down pattern assumed by the project-driven scenario of the SIA model. Second, by the end of the 1960's, the Gulf oil industry's demographic effects were sufficiently large and dispersed to be systemic; that is, contrary to the community-centered assumptions of the SIA model, they affected population patterns throughout the state. Finally, in the late 1970s when in south Louisiana towns like Morgan City, Abbeville, and Lafayette boomed, and in the mid-1980s when they busted, these effects occurred were concentrated in highly industrialized communities with long and strong links to a regional, oil-centered economy (Gramling and Freudenburg 1990). Thus, the basic causes of social effects in these communities conflict with the project-driven, community-centered assumptions of the SIA model.

Petroleum and Community Effects

The early oil industry certainly contributed to our images of boomtowns. Its Pennsylvania birth gave us the thriving town of Pithole overnight, which now exists only as a memory and roadside marker (Darrah 1972:252; Gramling 1996). The 1900 discovery at Spindletop, and discoveries that followed were marked by a progression of boomtowns—Jennings, Beaumont, Oil City, Vivian, Smackover, and others (Franks and Lambert: 1982). Kilgore, Texas, provoked a classic piece of boomtown literature (Chambers 1933). For the next two decades, discoveries followed the same general pattern. Flush production, the rush to capture oil, and cheek-to-jowl derricks generated booms and busts in surrounding towns (Bertrand 1952; Franks and Lambert 1982). However, even during these decades, changes afoot were weakening the forces feeding boomtowns. Within the industry, technological advances reduced labor demands and lengthened field life while managerial and legal changes tended to stabilize production and the workforce. Outside the industry, ongoing industrialization and urbanization, growing regional populations and economies, and improving transportation systems lowered local labor demand, increased locally available labor, and created alternatives for people seeking work. In oral histories, early industry participants wonder whether Kilgore was the last "real boomtown" (Boatright and Owens 1982) and a study of Permian Basin oil booms basically agrees with them. It finds that short-lived boomtowns were the exception after World War II. Most places experienced long-term benefits, growing with the boom, then declining, but not to pre-boom levels (Olien and Olien 1982). Postwar America has had its share of booms and busts but they mostly occur in urban and suburban contexts and their causes and consequences are seen differently. The phenomena addressed by classic SIA were striking because rural community growth was rare in the

rapidly urbanizing world of the 1970s and 80s.

The petroleum industry that began to develop in Louisiana's coastal wetlands in 1900 and that moved offshore in 1947 was subject to the same trends affecting the rest of the industry. However, its need to operate in wetlands and over water also made it different. One difference was that oil workers and their families could not live near the fields. Workers had to commute from *terra firma* to their jobs and the time and costs involved led to a system of concentrated work schedules. Men worked 12-hour shifts for 7, 14, or 21 days straight and then had an equal number of days off. Concentrated work schedules affected the industry's demographic outcomes in two ways. First, it stabilized the residences of the workforce associated with oil exploration and development. While onshore seismic crews, drillers and pipeliners and their families moved from field to field, in the offshore industry these workers could live in one community and be transported to the various fields. Thus, the forces within the industry that were encouraging a more settled workforce were earlier and stronger in south Louisiana than in the industry in general. Concentrated work schedules also encouraged geographic dispersal of offshore worker residences. Since workers commuted only once every 2, 4 or 6 weeks, they could live far from their point of embarkation. This meant that the "occupational communities" and occupational segregation found elsewhere in the industry were not maintained in south Louisiana (Affleck and Eakes 1976). Worker households were disperse within communities and workers could more easily participate in "traditional" activities during their time at home such as trapping and fishing. This pattern of dispersed worker settlement patterns associated with the maintenance of more rural lifestyles and long commutes-to-work reflects the general southern pattern of industrialization that differed from the earlier northern pattern. In the south, industrialization was not synonymous with urbanization. Factories were built outside of cities and workers settled in more rural areas such as in "ribbon" developments along connecting roads. This pattern was "particularly pronounced" in basic industries in south Louisiana, an area where the petroleum and petrochemical industries and rural communities have had a century-long interaction (Heberle 1948:34).

Other differences between south Louisiana and the rest of the industry resulting from the need to operate in wetlands and over water came from the need for a much larger, more complex and industrial support structure. This need served to stabilize the residences of an even larger worker population than that which commuted offshore. In classic SIA, the construction worker population moves from job to job creating the "boom" phase of the projects. Similarly, the offshore oil development phase requires front-loaded labor to build the platforms, exploratory rigs, and various ships boats and barges required to work over water. However, while this labor force is analogous to construction workers in classic SIA, fabrication and shipyards are geographically fixed and their workforce lives nearby, qualities that retard any tendencies to create boomtowns as envisioned by SIA. This raises a second aspect of the infrastructure needed to work offshore that, in the long run, proved to be even more significant in shaping the industry's demographic effects--its enormous size and complexity. Compared to its onshore relative, the offshore industry involves many more sectors of the economy and requires a much larger and more diverse labor force.

At the local level, differences from the onshore industry or the classic SIA image were apparent early, as the industry was beginning its evolution in Louisiana's coastal wetlands. The 1900 discovery at Jennings came on the heals of Spindletop. It, and the discoveries that followed at Vinton, Walsh, Iowa, Hackberry and other communities were marked by a rush to production and rapidly increasing and decreasing populations. The Jennings salt dome, which now has been producing for more than 100 years, exemplifies the changes in technology and strategy that have led generally to more stability within the industry (see Forbes 1946). However, more relevant here are changes related to operating in wetlands and over water. Already by the 1920s, several larger south Louisiana towns such as Morgan City, Lafayette and Lake Charles had already become oil supply centers, providing labor,

services, and fabricated equipment to oil fields over a wide territory and, for that reason, their growth became more robust and showed a diminished sensitivity to drilling activities in nearby fields. These communities were strategically located to serve the oil industry on a railroad and with access to water transport and were already centers for trade and manufacturing. Also, by the 1920's south Louisiana communities such as Golden Meadow were already serving as bedroom communities for rig workers commuting to platforms located in the area's uninhabitable wetlands (Bertrand 1952).

Petroleum and Systemic Effects

In 1947, drilling moved from near shore into the open ocean and, as it did, the enormous needs of the offshore industry for onshore support transformed it into the economic motor behind Louisiana's economy (Scott 1978). The statewide demographic effects associated with this enormous growth began to emerge in the 1960s must be seen against the backdrop of a declining, traditional, Southern, agricultural-based economy. After the Civil War, except for three decades, Louisiana experienced net out-migration until the 1970s. This means that more people left the state than moved to it except for the recession and depression years of the 1890s, 1900s and 1930s when few economic opportunities existed elsewhere. This departure from agrarian rural areas to more industrialized urban centers disproportionately affected Louisiana's blacks who have shown net out-migration for every post-Civil War decade except the 1870s (Maruggi, Vincent and Wartenberg 1996). These differences are and should be understood as reflecting differences in opportunities. During the decade of the 1960's, as south Louisiana's oil industry began to grow, the pattern of outmigration began to change. There was still the steady net out-migration from rural areas and blacks continued to leave at higher rates than they entered, but the net migration rate for whites became slightly positive. Moreover, the growing force of the oil industry in making the state more attractive to white inmigrants is evident in the geographic distribution of the changes. In the 1960s, only 13 of Louisiana's 64 parishes had net in-migration and all but two of these were in the urbanized, industrialized, and oil influenced southern half of the state. One exception was due to a military buildup at Fort Polk; the other was a northern urban center (Christou 1972; Maruggi, Vincent and Wartenberg 1996). In Louisiana's southern half, parishes experienced net in-migration due to white flight to suburbia, to real economic growth in the New Orelans and Baton Rouge metropolitan areas and the industrial strip between the two, and to the growth of the oil industry and associated refining and petrochemical industries. Also telegraphing the industry's emerging regional demographic effects was the growth of the coastal parishes of St. Mary and Lafourche, which were heavily involved with supporting its offshore activities (Burford and Murzyn 1972).

While the petroleum industry is known for its volatility, the 1960's began a decades-long period of a generally upward movement that accelerated in the 1970's, particularly after the Arab oil embargo, and continued to accelerate into the 1980s (Wallace, et al. 2001). During the 1970s decade, offshore production outpaced that of onshore (Lindstedt, et al. 1991) and this growing economic force and the opportunities it was generating was reflected in demographic change throughout the state (Scott 1981). The 1970s was the first decade since 1879 in which Louisiana experienced substantial net inmigration; 32 parishes—half of all parishes--showed net inmigration. Even black out-migration slowed. All areas of the state performed well although continued weakness in the northeast and along the Mississippi "indicate that agriculture and forestry based economies in the 1970's fared worse than the petroleum and manufacturing based areas" (Maruggi, Vincent and Wartenberg 1996:39, 41). As elsewhere in the country, suburbanization was a dominant factor in 1970s population growth. However, net in-migration was clearly related to the oil boom and the accelerated job growth that began in the early 1970s and that accelerated after 1974 with the Arab oil embargo in response to increases in oil prices (Maruggi, Vincent and Saussy 1985). The shift still should be seen against the backdrop of a declining, traditional, agriculture-based economy for it was due to increased inmigration

rather than to decreased outmigration, and the shift was pushed along because employment growth in the rest of the country was considerably slower (Maruggi, Vincent and Wartenberg 1996).

Net inmigration continued to accelerate into the early 1980s until oil prices began to fall and, then, to drop dramatically. By 1986, the oil industry had gone "bust." Again, the industry's demographic effects were felt throughout the state. Only four parishes had net in-migration, and these resulted from the continued trend toward suburbanization, not from economic growth. St. Tammany had the only significant amount of net inmigration which was due to an equally significant outmigration from New Orleans. In the 1980's, 60 parishes and all metropolitan areas experienced net outmigration. Again, the cause of net outmigration was not from an increase of people leaving Louisiana so much as from a virtual cessation of people moving into it. "The Louisiana economy again moved in the opposite direction of the national economy in the 1980's. Oil prices plummeted in 1981, triggering the oil-bust economic recession that lasted through most of the decade. In contrast, the United States enjoyed solid economic growth in nearly every year of the 1980's. Thus, the loss of the high-paying oil patch jobs that attracted workers to Louisiana in the 1970's resulted in an unprecedented out-migration of 411,099 persons in the 1980's…" (Maruggi, Vincent and Wartenberg 1996:11).

The effects of the offshore petroleum industry have often been compared to those of classic SIA boomtowns because, as is evident from the 1960's through 1980's, the oil industry is cyclic. By the late 1970's and early 1980's, at the height of the oil boom and when plentiful jobs in south Louisiana attracted recession-displaced workers from elsewhere, many people wrote of the area's boomtowns (i.e., Schweid 1989). Prior to the traumatic oil-price crash, the appropriateness of the classic SIA model was under debate (Gramling and Brabant 1986; Gale 1986). After the bust, this model seems to have been generally accepted in the assessment literature (Brabant 1994; Freudenburg 1992; Gramling 1992; Laska, et al. (eds.) 1993; Seydlitz 1993; 1995). The industry's unique mix of economic (e.g., elasticity of demand) and geopolitical issues (e.g., OPEC influence on supply) makes the industry more volatile than many, and one might debate how these cycles impact states, communities, and individuals and raise issues environmental impact statements (EIS) should assess. However, what is clear is that these systemic demographic effects are significant to an understanding of the Gulf oil industry's socioeconomic consequences and that they are not project related and that the classic SIA model sheds no light on them.

Louisiana "Boomtowns" circa 1980

Despite their sometimes rural environs, south Louisiana towns have had decades-long involvements with the offshore oil industry. The composition of this involvement varies from place to place, some may serve more as supply bases, others more as platform fabricators or as hosts for refiners, others as bedroom communities for blue-collar workers or white. However, in a very important sense these are industrialized places and a community's participation mix ties it to the industry's fate in specific ways (Tolbert 1995). While the petroleum industry is notoriously cyclic, business cycles do not generally make boomtowns and, after World War II, this issue lay dormant in south Louisiana for over 30 years. However, beginning in the 1960s, the offshore industry entered into an unusually strong and sustained period of growth that accelerated with the political events of the 1970s and to policy responses that led to what proved to be unsustainably high oil prices (Baxter 1993). This overheated economy coupled with a deep recession in most of the country did lead to the well published arrival of many people looking for work and back to the issue of boomtowns (e.g., Schweid 1989). We agree with Gramling and Brabant's (1986) original contention when they looked at the classic boomtown model and found that it does not reflect the realities of the Gulf's offshore industry. They argue that the industry's local evolution let communities adjust to its demands and, perhaps, adjust to it too well (Gramling and Freudenburg 1990b). We have added that demographic effects of the industry differ from the model in

that they are systemic (i.e., statewide) and driven by larger economic and geopolitical issues.

Gramling writes about Morgan City as the best contender for the title of boomtown. It lies in the heart of the oil patch and hosts fabrication yards—the most labor intensive and oil-price-sensitive sector of the offshore industry (Manuel 1985). Unlike classic boomtowns, Morgan City began its life as a port and industrial center, a way the northern investor Charles Morgan could avoid using the unionized Port of New Orleans (Baughman 1968). Gramling discusses the issue of housing. Morgan City experienced an elevated household demand as the industry grew in the 1940's through the early 1980's, but any shortage was reported as being due to limited space (from agriculture and wetlands) and to bank and builder unwillingness to construct blue-collar housing (Gramling 1980; 1984; Manuel 1997). The decades-long growth and long distance commuting mitigated any housing "boom" (Hughes, et al. 2001; Gramling 1989). Using Morgan City, Louisiana, as their example, Gramling argues that the slow evolution of the offshore industry gave communities time to adjust and that the concentrated schedule of offshore work encouraged long-distance commuting, which mitigated demographic effects. Gramling concludes that, as classic SIA predicts, the industry created labor demand in a small rural town and raised housing demand, but demand developed over time and did not outstrip the area's ability to respond (Gramling 1983).

The 1980's oil-price crash came at the end of a decades-long expansion of a massive industry that extended from Texas to Alabama, after OPEC actions had heated that expansion to a boiling point, and after a growing recession elsewhere in the country set droves of laid-off workers south to find work. The causes and effects of this bust underscore another basic difference between classic SIA and Gulf realities. In the Gulf, just as the industry's effects are not compressed in time, they are not compressed in space. In the mid-1980's, Morgan City's businesses closed, workers lost jobs or took pay cuts, and people left. However, these events were not the result of the completion of a project or a group of projects, and they were not the result of happenings in Morgan City. Rather, Morgan City was at the heart of a region wide economic depression that rolled through Louisiana, Texas, and Oklahoma as oil prices collapsed and exploration almost stopped. The cause was a downturn in a massive, regionally dominant industry. Moreover, when boomtown-like conditions occur, as in Morgan City in the late 1970s and early 80s, they appear to result from exceptional combinations of oil- and non-oil-related factors, such as an unusual concentration of fabrication jobs, an offshore overheated by an OPEC embargo, an economic recession elsewhere sending workers south seeking jobs, and city growth limited by wetlands.

Morgan City is no more a classic boomtown than is Flint, Michigan, which suffered through plant closures when the regionally dominant automobile industry reorganized in the face of Japanese competition. Actually, the 1980's oil price bust inverts the causal relationships postulated by the classic SIA. Effects occurred because the industry labor demand was long term and widespread, not compressed in time and within a few communities. Out-migration occurred as oil's downturn brought down other sectors of the economy; out-migration was not the cause of this downturn. Similarly, social services were overloaded because of a shrinking state tax base, not because of local demand. Causes were manifestations of larger-scale processes, and many of the drivers were unrelated to governmental or community actions.

To conclude, in classic SIA, a project's demographic effects are significant because they are compressed in time but, in the Gulf, no such compression can be observed. The 50 years of offshore operations in Gulf communities means that project labor demand is not new to them and that they are poised to meet it. A labor-intensive construction phase occurs in steel mills, machine shops, fabrication, pipecoating and shipyards, and in other settings that have evolved to do this work. The same is true for the labor-intensive construction phase offshore. The latitude and longitude of the

project is almost irrelevant. The work may occur at various locations offshore but it is marshaled on shore at ports, supply bases, and other fixed sites. Just as important, oil-involved communities do not experience the industry as a project with discrete phases but, rather, as a continuation of business. The distinction between phases is blurred. Supply boats and exploratory rigs built in the Gulf operate across the globe. Ports and service bases serve fields across wide areas of the Gulf. Projects in all stages of development are in a single filed. On a single platform, wells may be being drilled, others may be operating, and others may be plugged. Thus, phases tend to overlap and oil-involved communities tend not experience a project's labor demand as discrete. Fabrication yards bid on jobs. Labor demand from one successful bid blends into the next. The yard, its workers, and the community in which it is located are affected by the industry's business cycles and by changes in the industry that makes one yard more or less competitive than another. However, they are not affected by the compression of construction-phase labor envisioned by classic SIA.

Classic SIA versus the Gulf of Mexico

This overview of the demographic consequences of Louisiana's petroleum industry illustrates that the core assumptions of the classic SIA model—that new project labor demand causes demographic change that causes other project-related socioeconomic effects—do not pertain to the Gulf. In a sense, the early planners of the ESP were not far off when, based on their narrow reading of NEPA, they eschewed consideration of socioeconomic effects in the Gulf. A literalist acceptance of the classic SIA paradigm would put MMS in a similar place.[3] Adopting the NRC call to consider the Gulf as a "natural laboratory" for the study of the industry's socioeconomic effects has led MMS to eschew such literalism. The current ESP takes an eclectic, even opportunistic research approach to understanding the offshore industry's short- and long-term effects, one that assumes that many of these effects interact with other national- regional- and local-level ones in the Gulf's "dynamic baseline" (Smith 2000). While this approach should eventually lead to a more complete picture of industry effects, we have found that the same qualities that make the Gulf a good laboratory also raise difficulties for Gulf impact assessment at the lease-sale level. Below are listed "challenges" that have been identified.

The Challenge of the Baseline

Under NEPA, the difference between an area with and without the proposed action is the proposal's effects. The area *sans* proposal is the "baseline." However, since the industry has operated in the Gulf for decades, there is no "unaffected environment," hence no baseline as originally envisioned by NEPA. While, as noted above, this has led some to conclude that the program has no socioeconomic effects to be addressed, it has led others to ascribe all problems faced by oil-involved Gulf communities to the industry. This tendency is evident in much of the research MMS funded in its immediate response to the 1980's oil price bust, leading one frustrated oil executive to observe that, even if southern Louisiana had never had oil, it would not have remained an untouched Acadiana of happy fisher folk and trappers (Porter 1992).

The task of separating the effects of oil from other regional influences and from larger national and worldwide trends is neither easy nor certain. Past effects of oil and gas development on communities,

[3] This similarity between a narrow reading of NEPA and a narrow reading of the classic SIA paradigm is not chance. As the energy crisis of the 1970's grew and the Federal Government responded with a massive set of proposals to develop domestic energy sources, a serious planning effort was undertaken by Federal resource management and science agencies to assemble a research program to measure and mitigate effects. It is clear from the founding documents for what was later to become the MMS ESP that the classic SIA paradigm defined agency views of what constituted a program-related socioeconomic effect. The studies effort was limited to areas where new onshore activities (such as port construction) might have direct ecological or socioeconomic effects and was defined in terms of demographic change or perceived threats (Pikul and Rabin 1974; NAS 1978).

families, and individuals are bound up in other "baseline" trends.[4] Many social forces impinge on communities, families, and individuals such as mass communication, changes in education, and increasing community heterogeneity, to name a few. Often, even in oil-involved areas, the industry is just one of many causes of a particular effect (Wallace, et al. 2001). Identifying oil's share of socioeconomic impacts is made more difficult because most of these impacts are not unique to that industry. Even the effects of concentrated work schedules are found in other industries (Shrimpton and Storey 2001).

The Challenge of Defining the Affected Area

The Gulf Region is vast, covering Texas, Louisiana, Mississippi, Alabama, and parts of Florida and MMS assesses the economic and employment effects of the program on stakeholder states. Assessing these effects is difficult enough since they are shaped by each state's fiscal and tax policies, the distribution of other industries, and the industry's own purchasing and hiring patterns (Plater, et al. 2000; Luke, et al. 2002; Hughes, et al. 2001; Dismukes 2001). Also, within these states is a smaller, but still vast area of concern composed of 56 coastal zone counties and parishes that include the extremes of social, economic, cultural, and institutional variation. The task of providing a detailed assessment of industry effects across this area would be enormous but, added to this is yet another level of difficulties. Social and infrastructural effects are often defined by specific local conditions—the unused capacity of a certain school district, the growing demands on a particular water system, or the condition of a specific road connecting a port and highway (Keithley 2001). Combining and separating each parish and county are literally hundreds of cities, towns, school districts, port authorities, levee boards, special tax regions, and other tax jurisdictions.

Defining the boundaries of states and coastal zone counties and communities is simple enough, but the task of identifying and describing the salient variation within such wide-ranging "affected areas" is daunting especially as more and more local areas are added to the mix. This problem is magnified by the next two challenges discussed, that of identifying the offshore oil industry, a problem which also rapidly escalates at more local levels, and the challenge of "localizing" socioeconomic effects, of tying effects that occur locally (such as traffic or demands for social services) to actual places.

The Challenge of Identifying the Offshore Oil Industry

SIA addresses the effects of an "offshore petroleum industry" that lacks clear boundaries. The petroleum industry is really comprised of a multitude of various types of enterprises that are involved in the processes of finding, extracting, refining, and bringing petroleum-based products to market. Basic activities like drilling a well are generally undertaken by a number of firms and individuals interacting through contracts and subcontracts. Then, a myriad of firms and individuals are involved less directly, in such activities as legal or insurance work, trucking materials, providing food, and constructing roads, fences and outbuildings. Even in onshore areas where the oil industry is relatively small and where only some of its sectors are present, as in North Dakota, the numbers of enterprises required and the variability in their sizes, organization, and interactions make projecting the effects of onshore oil development extremely difficult (Chase and Leistritz 1982).

[4] For example, consider the always-sensitive issue of race and racism. To show racial discrimination in the oil industry in the 1920's, 40's, or 60's is not to prove an effect, rather it supports the unsurprising conclusion that this industry often reflects the imperfections of the society of which it is a part. An "effect" would be a change in racial outcomes. Some evidence from the 1940's (Jones and Parenton 1951; Brasseaux et al. 1994) and the 1990's (Tobin 2001) suggests that job-creation by the petroleum industry opened up opportunities for African Americans and other minorities in south Louisiana that did not exist in other rural areas of the state. While this positive effect is likely and is predicted by labor-queuing theory, could it be proven in the mishmash of history?

This challenge is immeasurably greater in the Gulf; first, because the full spectrum of enterprises involved in finding, extracting, and bringing petroleum-based products to market; second, because the support and transportation requirements for offshore operations add substantially to the complexities and variabilities of the "oil industry" and, particularly, to the upstream support of the industry (Manuel ed. 1983; Gramling and Brabant eds. 1984); third, because, however defined, the size and complexity of this industry is enormous; and, lastly, because, however defined, the industry's distribution across the Gulf is uneven. This challenge is manifested in many ways. For example, each industry has its own structure, economic dynamics, technologies, infrastructure requirements, labor organization and demands, community, and place in the U.S. economy, and for each industry, these attributes are changing over time. The fabrication, pipe-laying, drilling, diving, trucking, and supply boat industries all face different demands from the industry move to deepwater, and they also face different demands and opportunities onshore (Austin and McGuire eds. 2000; Wallace, et al. 2001). In the Gulf, many petroleum-involved industries are sufficiently large that changes to them affect regional economic activity, the industry's volatility, and geographic distribution, employment levels, workforce structure, the locus of decisionmaking, and other factors important to socioeconomic assessments. Identifying the petroleum-related industry is made more difficult because much of it consists of economic sectors that are only partially involved. In most states, the portion of catering that is oil-related may not be a significant issue. In Louisiana it is, but it is still just as difficult to identify from the economic census. Questions such as this, or how to evaluate "banking services," are particularly important since their relationships to the petroleum industry vary from place to place. In Louisiana, communities heavily involved in offshore oil with a mix of involved industries, noticeably affected socioeconomic outcomes during the 1980's price bust (Tobin 2001; Tolbert 1995).

The Challenge of Addressing Local Effects

MMS must assess socioeconomic effects for a set of lease sales. However, its sale and multi-sale EISs do not address the act of leasing; rather, they analyze the potential effects of future industry actions that may result from the sale. Actions resulting from the sale are defined as future industry activity on a block leased during that sale. This definition itself can only be partially true. Lease sales only create opportunities for petroleum industry actions. However, the actions themselves are undertaken based on the economic and business considerations of enterprises, considerations that change. Lease sales serve to maintain or to expand the arena in which these business decisions can be made; this arena of older and newer leaseholds geographically constrains activities but does not determine what kinds of actions the industry will take or where these actions will take place. To estimate the potential effects of a lease sale, MMS develops a scenario of the estimated number of wells and platforms that will occur on the leased blocks, However, under these conditions, the sale-level scenarios and projections that MMS develops are necessarily general and impossible to contextualize within the socioeconomic variation of the Gulf Based on past industry activity, MMS projects economic and demographic impacts for multi-county "subareas" because it has no basis for projecting sale effects at county or community levels. However, many social and infrastructural effects are often shaped even more by specific local conditions—the unused capacity of a certain school district, the growing demands on a particular water system, or the condition of a specific road connecting a port and highway. Thus, MMS faces the question of how to relate the multi-county projects necessitated by sale-level assessments to a consideration of local-level types of effects. Just as the baseline challenge implies that onshore effects cannot be linked to specific sales, this challenges the possibility of linking effects of a sale to specific onshore locations.

The Challenge of Addressing Cumulative Effects

The challenge of cumulative effects relates to the baseline challenge. From an assessment perspective, since the industry is already in place, a lease sale's primary socioeconomic effect is to keep the industry operating and maintain the status quo. The State of Louisiana has repeatedly complained that sale-level assessments do not adequately assess the cumulative effects of the OCS program on the state. While the baseline challenge addressed the problem of separating oil's effects from other regional influences and from larger national and worldwide trends, the State of Louisiana raises the issue of how sale-level effects should be assessed when many of the industry's past (or cumulative) effects have established limiting conditions for new ones. For example, drawing on our earlier discussion of demography, one of the reasons boomtowns are unlikely in the Gulf is that the local labor force has already been shaped by the industry, but, as the State of Louisiana notes, this does not really mean that there are no current effects from the program.

The Classic Model Revisited

This list of five "challenges" was developed piecemeal during an attempt to apply classic SIA, not to critique it. These challenges are sets of interrelated problems that loosely cover the entirety of assessments, from defining the study area through considering cumulative effects. We have discussed at length the problem of the paradigm's demographic heart. Here, we will briefly describe the wide range of other significant differences between the classic paradigm and the Gulf (see Table 1 for a summary).

Table 1 about here

Classic SIA assesses the effects of a project while the MMS Gulf Region is legally required to assess the effects of the program. This allows classic SIA to begin with real values for questions of location, size, and labor force demands while MMS assessments cannot. While MMS develops scenarios to estimate the sale of industry activity, these estimates are many times removed from the planning of any actual project. For the same reason, while classic SIA begins by locating a project in a community, MMS has no basis for locating sale-level effects in any particular community.

While classic SIA addresses projects in one or several communities, the MMS Gulf Region addresses a program in five states. While classic SIA addresses project effects in small, rural, isolated places, the MMS Gulf region addresses program effects that occur primarily in urban settings and in already industrialized rural settings long connected both to the industry and urban centers.

The enormous contrast in size, complexity and content of the study area between classic SIA and the one actually addressed by the MMS Gulf Region are mirrored in contrasts between the project effects addressed by classic SIA and the industry effects faced by the Gulf. SIA projects are new and foreign to its impact area; the oil industry and its projects are not new or foreign to the Gulf. All things end; oil production in the Gulf OCS would someday cease even if it were not a nonrenewable resource. However, in the context of assessment, the newness and foreignness of the projects in classic SIA mean they have a discontinuous life span, a planned beginning and a foreseeable end, while the Gulf industry that MMS must assess does not. Essentially, MMS is assessing the effects of an ongoing program, a slice of life that began decades before and that will continue decades more. In classic SIA, the limited lifespan of a project heightens its effects by compressing them in time. The effects of the Gulf oil industry are not compressed in time.

Classic SIA divides this compressed time into project phases, commonly construction, operations, and decommissioning. Obviously, each offshore project has its exploration, development, production, and removal phase. Indeed, MMS uses these phases when making its economic projections. However,

onshore, in such oil-involved communities as Morgan City, Lafayette, or New Orleans, the effects of one project blends into the next, and project phases are indistinguishable. Community experiences vary because their economic articulation with the industry varies, because they are more or less dependent on fabrication, or refining, or providing legal support, and because of the industry's cyclic nature, its technological advances, and its reorganizations affect each of these activities differently in both the short and long run. Finally, even though classic SIA addresses large-scale energy projects, the compression and segmentation of time leads it to focus on the construction phase and construction trades. In the Gulf, fabrication is just one piece of an entire industry that must be assessed.

Not only are the impact area and agent differ, so does the relationships among the two. In classic SIA, a project is imposed from without; project organization and technology are unfamiliar. This raises issues about the ability of local governance and governing elites to respond. More important to the model, however, project labor demand is greater than the local supply. This, along with compression in time, creates the boom and bust. In the Gulf, the offshore industry developed in the area. Its organization and technology are familiar, and, more important; the local labor force developed and was shaped by the developing oil industry. New projects do not lead to unusual labor demands or to the booms and busts envisioned by classic SIA. As described above, the industry is cyclic and its ups and downs affect communities, but project demand, or even multiple projects associated with a lease sale, do not produce boomtowns.

In classic SIA, effects are decision driven, that is, the decision to allow a project leads directly to the effects to be analyzed. This makes the assessment process rationalistic or deductive. Other socioeconomic effects flow from, and are deduced from, the projects' predicted labor demand. In the Gulf, the assessment process must be more empirical and inductive. Industry activity comes not from the government's decision to hold a sale but, rather, from such economic factors as oil price. For this reason, assessment must remain probabilistic rather than deductive. Outcomes are less predictable because the forces that drive activity are exogenous to the kinds of economic projection models that are used.

Conclusions

The boomtown SIA methods discussed here were formulated to measure impacts: (1) in small and easily definable areas (e.g., communities, counties); (2) from single, often one-dimensional, causes (e.g., a generating plant); (3) of developments of relatively short duration (e.g, several years); (4) where the impacting agent is externally imposed (i.e, no evolutions of existing enterprises; and, (5) where the impacting agent overwhelms the community's institutional structures, infrastructure capacities, and labor force.

Oil development in the Gulf falls on the opposite end of the continuum on each of these qualities. Oil development has occurred in every Gulf state and has occurred over more than a century. It has evolved in concert with many other social, political, economic,and technological changes in the region, the country, and the world, the consequences of which dwarf, mask, inspire, add to, and mitigate the more obviously oil-related effects in the Gulf. The petroleum industry has evolved in response to the invention of the automobile, two world wars, the interstate highway system, international oil consortia, and international political relationships to name a few significant influences. Unlike energy boomtown impact scenarios in which impacts are abrupt and of fixed duration, the Gulf oil and gas industry has grown enormous, its influence has reach across the seas, and its end is not in sight. Thus, no closure or final tally of impacts is possible.

Moreover, the industry is an extremely complex one that includes “major” and “minor” oil companies, platform and pipeline construction firms, port authorities, vessel and helicopter operators, high-technology instrument design and fabrication companies, seismic survey companies, GIS mapping firms, diving companies, trucking companies, caterers, waste disposal companies, and a myriad of other types of firms. It includes some of world's largest companies and single-person enterprises, high-paid workers and low-wage ones. While oil “development” may be the precipitating "cause," the agents of social and economic effects are now numerous, varied and diversified and include federal, state and local governments. For example, state royalty revenue and statewide revenue sharing policies ensure a distribution of benefits disproportionate to burdens. The course of change has been anything but unilinear and its pace may be accelerating.

What is clear from even this superficial examination of the effects of OCS activities is that a traditional NEPA-style analysis is woefully inadequate to address their scale, complexity and duration. It is also evident that the traditional “boomtown” SIA paradigm does not, and cannot, provide the conceptual framework or methodological tools to accomplish this task. We have described some of the reasons why the MMS ESP has pursued, and will continue to pursue, a more realistic and robust approach to measuring and evaluating changes associated with its lease sale activities in the region. For now, at least, our approach will not champion a particular model. Rather, it will take an eclectic approach. It will view SIA as a set of topics or issues that should be assessed. This set of topics will come from NEPA scoping and other agency information gathering efforts, and from existing SIA literature. For each of these topics, the mechanisms by which it is affected by the industry, the degree to which it is affected, and how these effects relate to other industry effects will be empirical questions. Internal consistency will derive from the goal of SIA—the assessment of industry effects for each topic. Scientific consistency will come from the logic and findings of the academic fields relevant to the topic or issue being analyzed—from the field of criminology when looking at crime as an example. As projects increase in complexity, scale, and duration, we expect other agencies will increasingly rely on similar approaches in responding to their legal and practical obligations. To the extent this reflects a shift away from the traditional SIA paradigm, we believe is it is well founded and long overdue.

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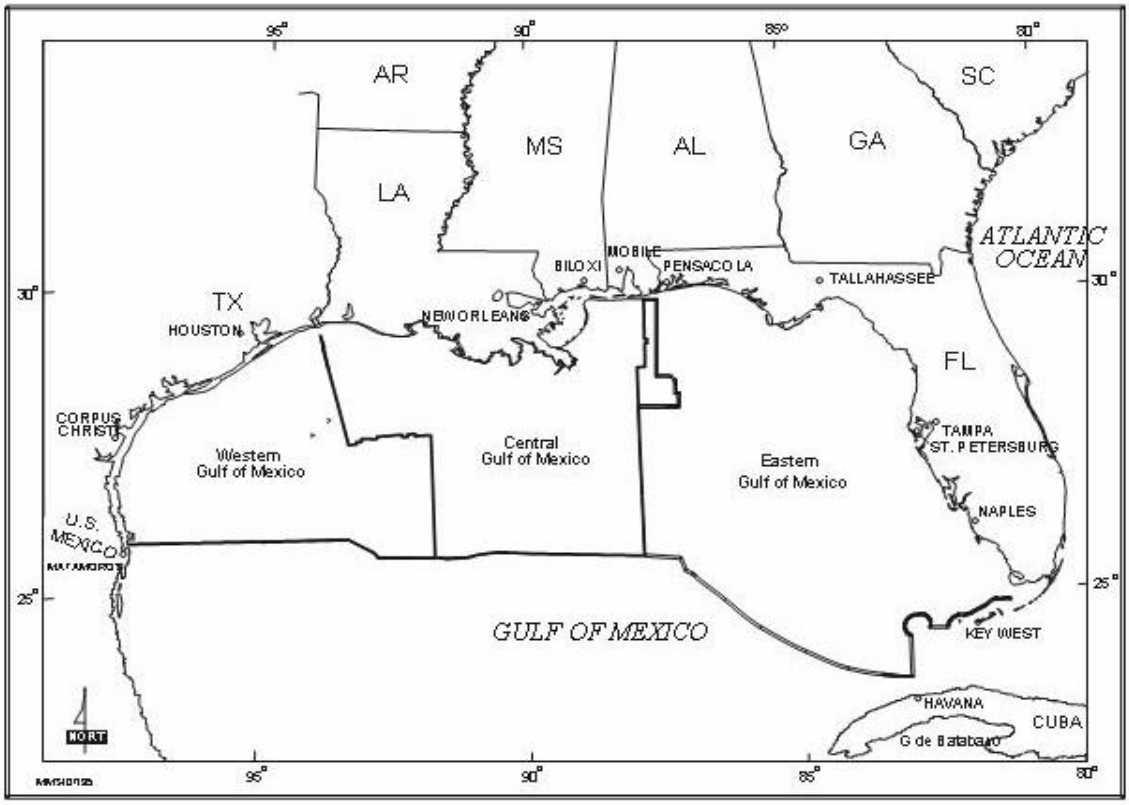

Figure 1: Gulf of Mexico Region

TABLE 1: Differences between the SIA paradigm and Gulf Realities	
SIA	***GOMR***
Assesses a project	Assesses a program
Assessment area = the community	Assessment area = 5 states
Community small, rural & isolated	Affected areas include urban and/or industrialized
Project new to area	Program (and industry) developed in area
Project timeframe discontinuous	Program timeframe ongoing
Timeframe segmented	Timeframe segments all ongoing & overlapping
Effects concentrated in construction	Effects of segments indistinct
Project imposed from without	Program (industry) evolved in area
Project organization unfamiliar	Industry tied to local entrepreneurship
Project technology unfamiliar	Project technology locally-developed
Project scale massive & unfamiliar	Project scale typical and familiar
Labor demand greater than supply	Local labor supply matched to industry
Labor demand compressed in time	Labor demand continuous
"Boom and bust" concerns	Market fluctuation concerns
Effects decision driven	Effects economically driven
Assessment rationalistic	Assessment probabilistic
Outcomes more "predictable"	Outcomes less "predictable"