ESTABLISHING A SOCIAL AND ECONOMIC BASELINE PRIOR TO THE DEVELOPMENT OF AN OFFSHORE OIL INDUSTRY: AN EXAMPLE FROM THE GREAT AUSTRALIAN BIGHT

Sean Pascoe
Marine Resource Economist, CSIRO Oceans and Atmosphere, PO Box 2583, Brisbane, Qld, 4001, Australia. Email: sean.pascoe@csiro.au.

Andrew Beer
Professor, University of South Australia Business School, North Terrace, Adelaide, SA, 5000, Australia.

Charmaine Thredgold
Research Fellow, University of South Australia Business School, North Terrace, Adelaide, SA, 5000, Australia.

Michael Young
Professor, Centre for Global Food and Resources, University of Adelaide, North Terrace, North Terrace, Adelaide, SA, 5000, Australia.

Steve Whetton
Deputy Director, South Australian Centre for Economic Studies, University of Adelaide, North Terrace, North Terrace, Adelaide, SA, 5000, Australia.

ABSTRACT: The potential development of an oil industry in the Great Australian Bight provides a number of opportunities and challenges. Potentially, the development may affect local communities, regional economies and the environment. Developing a baseline, before any development takes place, enables changes due to the development being better identified and understood. The aim of this study was to develop a comprehensive baseline for the social and economic environment of the region most likely to be impacted by the development of an oil industry in the Great Australian Bight. The baseline study identified that the region is characterised by a small and sparsely distributed population, highly dependent on primary industries for the most part. The study also identified that there is a strong attachment to place in the region, with the current pristine coastal and marine environment a key factor underlying this attachment.

KEY WORDS: Social and economic baseline; social impact; offshore oil; fisheries impact.

ACKNOWLEDGEMENTS: This study was funded by the Great Australian Bight Research Program, a collaboration between BP, CSIRO, SARDI, the University of Adelaide and Flinders University. The Program aims to provide a whole-of-system understanding of the environmental, economic and social values of the region; providing an information source for all to use. The authors would like to thank Gavin Begg and Ben Baghurst, (SARDI Aquatic Sciences); Rod Lukatelich (BP) and David Smith (CSIRO), and the anonymous journal reviewers for their useful comments on earlier versions of the paper.

1. INTRODUCTION

The Great Australian Bight is a region of high conservation significance that also supports a wide range of anthropogenic activities. Several large marine parks have been established in both State and Commonwealth waters, and the region supports important marine and coastal ecotourism ventures that take advantage of the current pristine environment. The coastal waters have cultural significance for the region's Indigenous communities and support iconic recreational fisheries. The region also includes some of Australia's most valuable commercial fisheries, which operate in coastal waters as well as on the continental shelf and slope. Multiple aquaculture leases are also spread along the coast. The region is heavily dependent on agriculture and other forms of coastal tourism, which have helped shape the local community structures.

The Great Australian Bight is potentially the home of a new offshore oil and gas industry. In January 2011, BP was awarded four exploration permits about 300 km south-west of Ceduna on the western side of the Great Australian Bight and committed to a work program that includes

drilling four exploration wells. Also in 2011, Bight Petroleum was awarded two leases west of Kangaroo Island and south of the Eyre Peninsula. In 2013, Equinor (previously Statoil) acquired a 30 per cent share in BPs exploration program; Chevron was awarded two permits east of the BP/Equinor leases; and Santos/Murphy was awarded a lease further west.

In 2016, BP decided not to proceed with drilling, and in 2017 transferred its interest in two lease areas fully to Equinor (previously Statoil), who are committed to drilling at least one exploration well. In 2017, Chevron also decided not to proceed with drilling, citing low oil prices. Other oil-related developments, however, are still being considered in the region.

Given the potential for the development to adversely impact the marine environment (and thereby the dependent industries and communities), the development of the industry has faced opposition by conservation groups as well as other local groups with an interest in protecting the coastal areas. Opposition is not universal, however, and others support the employment and infrastructure benefits such a development may bring to the region. Any development is likely to change the structure of at least some regional communities, either through the introduction of new opportunities or, in a worse case, environmental or resource damage through accidents. To gain community support, activities in the region need to be viewed as ecologically sound, socially and politically feasible, and morally just (Brechin *et al.*, 2002). Such conditions require first the establishment of a social and economic baseline that captures the current conditions and concerns in the region. Establishing a baseline is necessary to identify the magnitude of any changes – both positive and negative – should they occur. In addition, an understanding of the concerns of the local communities regarding any development of an offshore oil and gas industry will help plan both the development of the industry as well as aid in engagement and communication with the local communities.

This Paper provides an overview of the key findings from a social and economic baseline study undertaken as part of a broader study documenting the environmental, social and economic conditions in the Great Australian Bight prior to the development of any offshore oil industry (Ward *et al.*, 2014). As well as providing a baseline against which potential changes can be assessed, the study identified key social and economic drivers, attitudes and potentially critical sectors in the social and economic structure of the region. While the results of this study are specific to the Great Australian Bight region, the approach provides an indication

of what factors future studies may need to consider when establishing baseline conditions in coastal areas.

2. THE ROLE OF BASELINE STUDIES AND SOCIAL IMPACT ASSESSMENT

The Deepwater Horizon spill demonstrated that, in addition to ecological impacts, social and economic impacts may be substantial (Smith *et al.*, 2011; Hale *et al.*, 2015; Deepwater Horizon Natural Resource Damage Assessment Trustees, 2016; Morgan *et al.*, 2016). Subsequent research has found that social connections to natural resources, demographic factors and the state of the underlying regional economy (which influences resilience) play central roles in shaping the way both individuals and communities experience disasters (Safford *et al.*, 2012). Attachment to place, while enhancing community resilience, has also been found to increase perceptions of negative impacts of an environmental impact (Lee and Blanchard, 2012).

Given this, it is necessary to understand the baseline condition of natural resources and dependent communities prior to any development that may increase environmental risk (Kennedy and Cheong, 2013). The determination of environmental or ecological baselines is a fundamental and long-established component of environmental impact assessment (Wathern, 2004), and is a requirement in many jurisdictions prior to the development of industries with the potential to damage the resource base (e.g. Huguenin *et al.*, 1996; UK Onshore Oil and Gas 2015). While assessments of social and economic baselines are also considered necessary components of a broader impact assessment framework (Wathern, 2004), these are less commonly undertaken. In an era where social licence to operate is becoming increasingly important (Wilson, 2016), understanding local communities, their constraints and their concerns is an important component of the development process for any industry that runs the risk, however small, of environmental damage.

Although in many cases it is possible to reconstruct a social and economic baseline *ex post* (Lotze *et al.*, 2006), such a process is non-trivial, and adds additional uncertainty to any impact assessment. Further, retrospective baseline studies elsewhere suggest that different methods may yield different results, potentially obfuscating the development impacts that are being assessed against these baselines (Huettner *et al.*, 2009). An appropriate baseline provides not only a point of reference against which any future impacts can be assessed (Guo *et al.*, 2017), but may identify critical points in any socio-ecological system which need to

be taken into consideration during the planning process. This results in the reduction or mitigation of any potential future harm. Including community concerns into the baseline assessment also allows monitoring and response programs to be developed that recognise these concerns.

A social and economic baseline is a core component of social impact assessment (SIA). SIA aims to understand the consequences of a proposed change or development before they arise, helping decision makers in the public and private sectors make better-informed decisions about whether to proceed, and which options to pursue (Becker, 2001). SIA differs from other forms of evaluation – such as environmental impact assessments or resource assessments, in that it focusses on the ways in which people live their lives – their aspirations and needs; it considers cultural issues and it affords a central role to the community and the institutions that support it. SIA is often considered to be an essential tool in delivering sustainable development as it encourages better social and environmental management (Vanclay, 2003; 2012). It also promotes better planning processes for major developments, being embedded in the early planning stage of proposals. There is no single approach to undertaking an SIA, which may include a combination of an analysis of past trends, scenario development and assessment, and expert consultation, to name a few.

3. METHODS

While each baseline study will depend on the unique characteristics of the region as well as the potential threatening process, Moseley (1996) suggests such social and economic baseline studies should include an initial desk analysis of existing information and literature, a survey of key actors or agencies, a survey of households potentially affected and group discussions (focus groups) to identify key opportunities and threats. Such an approach was adopted for this study. Further, while there are potentially a wide range of indicators that could be included in a baseline study (Moseley, 1996), the baseline study should focus on the social and economic characteristics of the region that are likely to be impacted by the potential development (Zilans and Abolina, 2009).

The Great Australian Bight study was undertaken by a research team including social scientists, regional economists and fisheries economists. The first team documented the current socio-economic status of the regional communities and identified current concerns about the development of an oil industry in the region (Beer and Thredgold, 2017).

This includes developing community profiles (especially coastal communities) and their level of economic diversification with emphasis on identifying communities' reliance on particular industries (e.g. fishing and tourism). How communities are structured socially—including information around Indigenous communities, labour force, education, religion, their sentiment toward relevant issues and political persuasions—provides an understanding of their resilience and adaptation capacities.

As well as developing a social profile of the region, the social component also examined the views, aspirations and concerns of the existing residents, and was based on both secondary information (e.g. research literature, Census data, and other secondary sources) as well as primary data collection. The latter involved information collected through one-on-one interviews with key local sector representatives; an online survey of the broader regional communities (with 79 respondents); and ten focus groups across the region, including two Indigenous based focus groups. The broad approach undertaken follows that proposed by the Interorganizational Committee on Guidelines and Principles for Social Impact Assessment (1995) and is consistent with the best practice identified by Moseley (1996). This process includes identifying baseline conditions, scoping the range of impacts, predicting the likely effects of a development and estimating the communities' response to these impacts.

The second component was aimed at providing an economic baseline for the onshore industries in the region, identifying the range and relative importance of the different industries to employment, income and the processes currently driving development of this region (O'Neil *et al.*, 2016). The third component focused on the offshore economy, particularly on the fisheries and aquaculture industries in the Great Australian Bight (Pascoe and Innes, 2017). These were considered to be of particular importance to the region—both economically and socially—and potentially the most directly affected by environmental impacts.

Both economic components of the study were largely based on secondary data produced by national and state based statistical agencies and government departments. Information for the study is largely drawn from; Australian Bureau of Statistics data both from the Census and from other collections, previous studies undertaken by the South Australian Centre for Economic Studies, Regional Development Australia studies, and data collated in other research studies. In addition, consultations were undertaken with selected stakeholders in local government and industry. Data from these sources were combined to provide an overview of the key economic drivers in the region, including the fishing and aquaculture sector.

Both the onshore economic component and the social component focused on the Eyre Peninsula and the West Coast (EPWC) region (Figure 1), which was the area most likely to be affected by the development of an offshore oil industry (i.e. closest to the main exploration areas). The offshore component (fisheries and aquaculture) considered the entire Great Australian Bight region, including the south coast of Western Australia through to the Victorian border (see insert in (Figure 1). This broader area was considered as any potential adverse marine impact (for example, due to an oil spill), would extend potentially across the entire Great Australian Bight, whereas onshore impacts are likely to be limited to adjacent coastal communities.

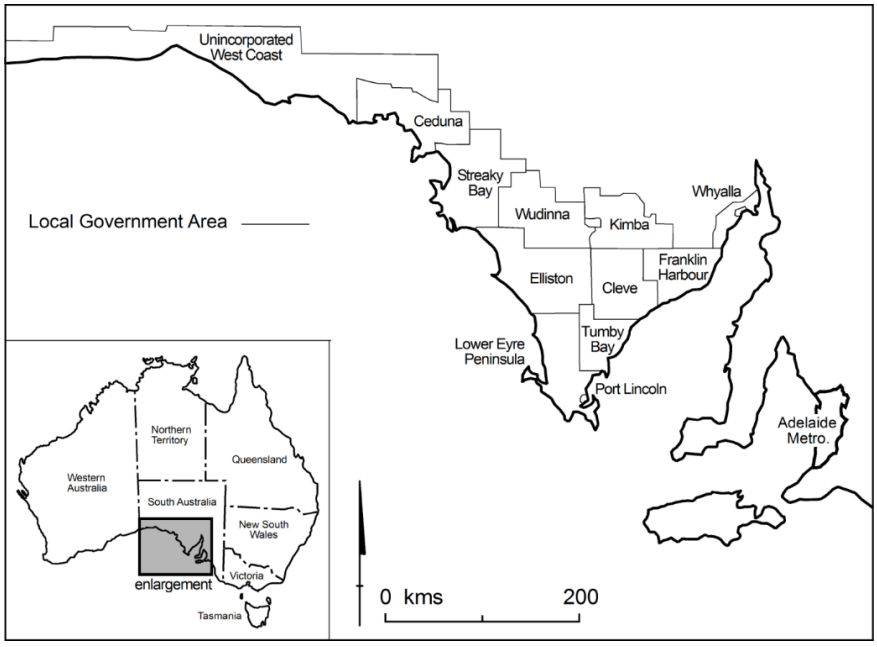

Figure 1. Map of the Eyre Peninsula and West Coast Region Study Area.
Source: Beer and Thredgold (2017).

4. ESTABLISHING THE HUMAN RESOURCE BASELINE

Social Profile of the Eyre Peninsula and West Coast Region

Development of oil or gas resources in the Great Australian Bight has the potential to change the structure of at least some regional communities on the West Coast and throughout the Eyre Peninsula. The EPWC is a relatively under-developed part of South Australia, with the region having a relatively small population scattered over a large area.

Change has been evident in many of these communities over the last three decades, and these transitions have included; a decline in conventional agriculture, the rise of aquaculture, the development of a strong export focus of the fishing sector, and the emergence of mining, both in the recent past and in prospect. The region has a strong, export-focussed economy, largely reliant on the production of primary products—grains, seafood, livestock etc. From interviews held with key stakeholders, there is a belief that the skills in the labour force—that is, the quality of human capital—is a limiting factor for the further development of the region. Respondents noted that the seasonal nature of much employment meant that many individuals needed training across industries and sectors. Agriculture is still the main industry, but farm consolidation and efficiency increases have resulted in this sector employing fewer people, which has subsequently affected small communities.

In 2012, the EPWC region had a population of around 56 300 roughly two thirds of which were located in the local government areas (LGAs) of Whyalla and Port Lincoln on the Spencer Gulf. Around six per cent of the population are of Indigenous heritage. The Nauo (south western Eyre), Barngarla (eastern Eyre), Wirangu (north western Eyre), and Mirning (far western Eyre) are the original Aboriginal nations present and maintain traditional ties to Country in the study area.

Population growth in the region is less than the state average, with three of the LGAs experiencing population declines during the period 2001 to 2011. The small population is believed to lack the critical mass needed to meet the needs of growing industries, and strategies that deliver population growth are considered important for the region. With the exception of Whyalla, unemployment in many of the smaller parts of the EPWC is relatively low, but this reflects a net emigration from these areas to other parts of the region, with many younger (ex) residents looking towards Adelaide for employment opportunities. The remaining workforce is relatively old, with 44 per cent over the age of 45 years. In contrast, incomes in the region are generally higher than those of Adelaide, a result

of the earlier mining boom and development of aquaculture businesses in the region.

Adults resident in the region are much less likely to have qualifications beyond high school than the South Australian average, with 51 per cent having no post-school qualification, compared with 46 per cent of all South Australian adults. School completion rates in the region are also less than the state average, with a higher proportion of students leaving school before completing their year 12 certificate. Only nine per cent of working age adults in the region hold a bachelor's degree or higher, half the rate for the State as a whole (18 per cent). In contrast, the region has a higher proportion of adults with vocational (TAFE) qualifications than the State on average, reflecting the dominance of primary industries in the region.

Many focus group participants noted that the EPWC offered a high quality of life and a near-pristine environment. A very high percentage of participants made use of the natural assets of the region and derived value out of the environment in some way. Virtually all participants had visited beaches and 85 per cent had made use of national parks or conservation parks. Just under 50 per cent had visited a marine park or reef and just over 40 per cent had visited a botanical park or public garden.

In a number of focus groups, the strong value placed on environmental quality spilled over into avowed opposition to any development that was seen to be a threat, either onshore or offshore in the Great Australian Bight. For Indigenous participants, the environment was an important material resource, spiritually significant and a central part of their heritage.

A clear majority of survey and focus group participants felt a strong connection to the EPWC region and reported a high degree of satisfaction with their life there. There was a very strong sense of place attachment, and a well-developed appreciation of the community that people live in. There was a high level of trust for neighbours, and an awareness of the frequent contact between individuals and households. High levels of community support activity (e.g. volunteering) were also reported by the participants, underpinning the perceptions of high levels of social capital across the region.

Onshore economic profile

The EPWC accounts for approximately three per cent of the State's total output, with a gross regional product (GRP) of around $2.6 billion in 2012-13. Sixty per cent of the EPWC's total GRP is produced in the two most

populous councils of Port Lincoln ($768 million) and Whyalla ($823 million) (Figure 2).

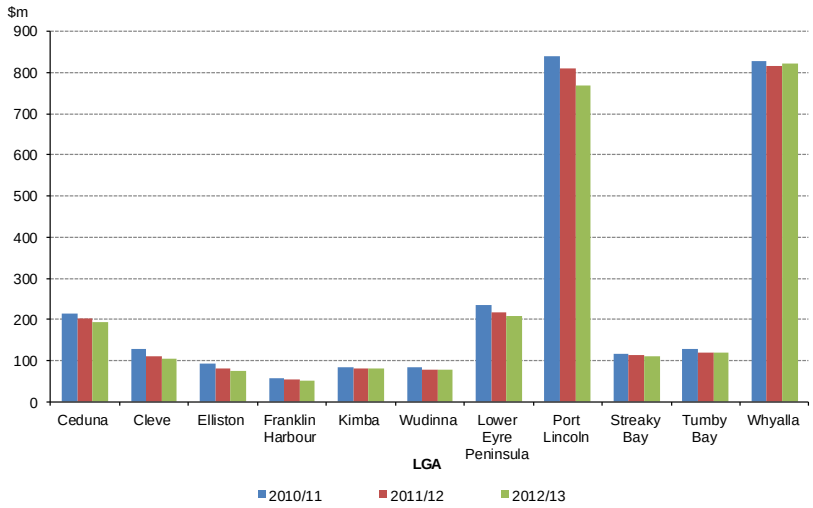

Figure 2. Gross Regional Product by Council—Eyre Peninsula and West Coast, 2010/11, 2011/12 and 2012/13. Source: O'Neil *et al.* (2016).

Agriculture is the main industry in the region in terms of value, with grain crops (wheat in particular) being the most valuable component. In 2011-12, grains had a gross value of product of $406 million, representing 13 per cent of the GRP. Cropping land in the Eyre Peninsula represents 36 per cent of the total cropping land in South Australia. Grazing is also an important agricultural activity, with grazing land in the region representing 16 per cent of the state total. The main grazing activity involves sheep for wool, with meat and cattle livestock being less significant (approximately 2 per cent of South Australia's total), and pigs and poultry production accounting for less than one per cent of South Australia's total. Other agricultural activities on Eyre Peninsula include small scale nurseries involved in flower cultivation, fruit and nut orchards/production (e.g. olives, grapes for wine production and consumption), vegetables (e.g. carrots, lettuces and tomatoes), and hay and silage production (especially cereal cut for hay).

Mining is the second largest industry in the region, contributing around eight per cent of the region's GRP in 2011-12, with a gross value of production (GVP) of around $283 million and generating exports worth

$333.6 million. Six of South Australia's 21 mines operating as at 2014 are located in the EPWC. Mining currently comprises a small share of economic activity in the region but the scale of the identified resources in the region means that significant potential for growth exists over the medium term depending on commodity prices and extraction costs. The Eyre Peninsula is rich in iron ore with high grade deposits of hematite and magnetite. Mineral exploration up to 2013 had identified up to one billion tonnes of proven iron ore resource with an estimated value of between $100 billion and $140 billion based on the prevailing prices in 2014.

Tourism is also a significant industry in the EPWC. Tourists are drawn by natural attractions including, beaches, sea life, wildlife, marine parks and national parks. It is these natural assets which have been capitalised on to provide visitor experiences, i.e., sightseeing, wine tasting, dining, fishing, swimming, shark diving, boating, whale watching and other leisure tours. In 2012/13 the Eyre Peninsula attracted 683 000 visitors with expenditure of $255 million, the majority being domestic overnight and day visitors. There were 582 tourism businesses operating in the Eyre Peninsula in 2012/13, most either Micro (1-4 employees) or Small (5-19 employees) scale.

The major sources of employment in the region include agriculture and fishing (roughly 14 per cent of the total employment in the region), manufacturing (12 per cent, but restricted mostly to Whyalla), health care and social assistance (12 per cent), and retail trade (11 per cent). Indigenous employment is concentrated in public service industries, notably Health Care and Social Assistance (25 per cent), Education and Training (ten per cent) and Public Administration and Safety (seven per cent). Mining companies cooperate and support Indigenous communities providing Indigenous education and training programs which upon successful completion provide participants with a certificate qualification and permanent position within the mine. Mining's share of employment for Indigenous persons of eight per cent as at the 2011 Census (up from 3.3 per cent in 2006) increased in line with new employment opportunities in recently opened mines (i.e., over the past 5 years) across the region.

Unemployment in the region has generally been lower than the State average, although high rates of unemployment (Eight per cent-ten per cent) have persisted in Ceduna. Indigenous groups in the region have higher rates of unemployment and lower labour force participation compared with non-Indigenous groups. Income support dependence is high in these groups, and education outcomes are below the state average, with skills

training and development is also low. As a result, Indigenous labour is generally at a disadvantage in the region.

Offshore economy

A wide range of commercial fisheries and marine based aquaculture industries operate in the coastal and Commonwealth managed waters of the Great Australian Bight. In South Australia, total GVP from fisheries and aquaculture was estimated to be around $400 million in 2013-14, split roughly 50:50 between wild caught and farmed production (Figure 3). Total direct employment in the wild caught sector was 1150 in 2013-14, with an additional 750 employed in aquaculture.

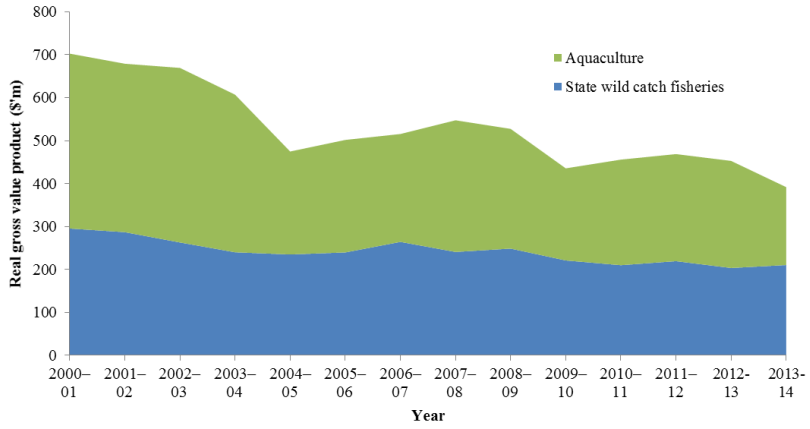

Figure 3. Real Gross Value of Production, SA Fisheries, 2013-14 Dollars.
Data source: ABARES (2013),ABARES (2015) EconSearch (2014a; 2014b).

The most valuable South Australian commercial fisheries are the lobster fisheries, representing around 50 per cent of the total value of South Australia's wild-caught fisheries production as well as around 50 per cent of the total fisheries employment. Most of the lobster are taken in the eastern half of the Great Australian Bight. Other key fisheries (e.g. prawns, blue crab and sardines) largely operate within Spencer Gulf, although catch is taken outside of the Gulf. The most extensive fishery—the Marine Scalefish Fishery—operates along the central and west coast. While relatively low in value (around 17 per cent of the total GVP) and profitability, this fishery is the largest in terms of fleet size, and also

represents around 25 per cent of the total employment in the wild-caught fishing sector.

South Australian aquaculture production is largely found along the EPWC. Tuna ranching represents around two thirds of the total aquaculture value, and takes place largely around Port Lincoln, on the Eyre Peninsular near the mouth of Spencer Gulf. Oysters are grown primarily along the west coast from Coffin Bay and account for around 17 per cent of the total aquaculture value. Oyster production has increased substantially over the last decade—by around ten per cent per annum—although the recent (2016) outbreak of Pacific Oyster Mortality Syndrome (POMS) in Tasmania has limited the supply of spat available for South Australian producers. As much as 80 per cent of oyster spat had been obtained from Tasmania, the supply of which was banned following the POMS outbreak. As a result, oyster production will be substantially lower in 2017 and 2018, with oyster production not expected to fully recover to recent levels until mid-2019.

The estimated downstream and flow on effects to other sectors associated with fishing and aquaculture in South Australia are substantial (EconSearch, 2014a; 2015b). Downstream impacts include fish processing and other economic activities dependent on the industry, while flow-on impacts represent the derived demand for other services in the region such as boat building, fuel supplies and other related input supplying industries. In South Australia, both wild fisheries and aquaculture each result in total output of around $700 million a year—a combined impact of around $1.4 billion—and the generation of household incomes of around $350 million a year. As well as the 1 900 people directly employed (as noted above), these sectors are estimated to generate an additional 3 700 jobs in upstream and downstream industries (EconSearch, 2014a; 2015b).

Western Australian fisheries along the Great Australian Bight are relatively small by comparison, with a GVP of only around $21 million in 2013-14. This value, however, derives from a wide range of fisheries, mostly inshore and estuarine based. While aquaculture is undertaken in the area, only a handful of operators exist and information on the value of production is unavailable. The impact on the local economy of these fisheries is uncertain as the only previous (and non-recent) study was at the state-wide level. From this, the fisheries may generate up to an additional $23 million in flow-on benefits to the regional economy.

Commonwealth managed fisheries in the Great Australian Bight contribute around $60 million to the fisheries GVP in the Great Australian

Bight. This has declined by 50 per cent in real terms from its peak in 2001-02. Production is dominated by the Southern Bluefin Tuna fishery, which provides the stock for the tuna ranching industry, the largest aquaculture sector by value in South Australia.

Recreational fishing in South Australia involves a charter boat sector as well as non-charter boat fishing. The GVP of the charter boat sector is around $4.3 million a year—relatively small compared with the commercial fishing fleet (EconSearch, 2015a). GVP in this case is based on revenue raised from charging recreational fishers rather than reflecting the value of the fish caught. Charter boat based recreational fishing provides other indirect economic impacts as most anglers also need to travel to the ports and stay in local accommodation. This is estimated to generate an additional $20 million in benefits to the local economies.

From the last available recreational fishing survey (2013-14), over a quarter of a million recreational fishers were estimated to have fished for nearly one million days (with around 20 000 of these days potentially also included in the charter boat GVP) (Giri and Hall, 2015). Based on these values, and assuming similar levels of recreational benefits per trip to other South Australian studies (Rolfe and Dyack, 2011), recreational fishing in South Australia may generate around $115 million a year in non-market benefits.

5. PERCEPTIONS OF IMPACTS OF THE DEVELOPMENT OF AN OFFSHORE OIL INDUSTRY – OPPORTUNITES AND THREATS

Most survey respondents felt any development would result in gains for infrastructure provision (Figure 4), which was identified in the study as a potential constraint to economic development in the region, and hence have a positive impact on the economy of the EPWC. Most also expected population growth as a result of this development, which was seen as a desirable outcome, and also agreed with the findings of the focus groups where many participants noted the impacts of population loss with some considerable concern. Belief that the development would have a negative impact on their community was evenly split, with roughly equal proportions believing it would have a negative impact as believed it would have a positive impact (Figure 4).

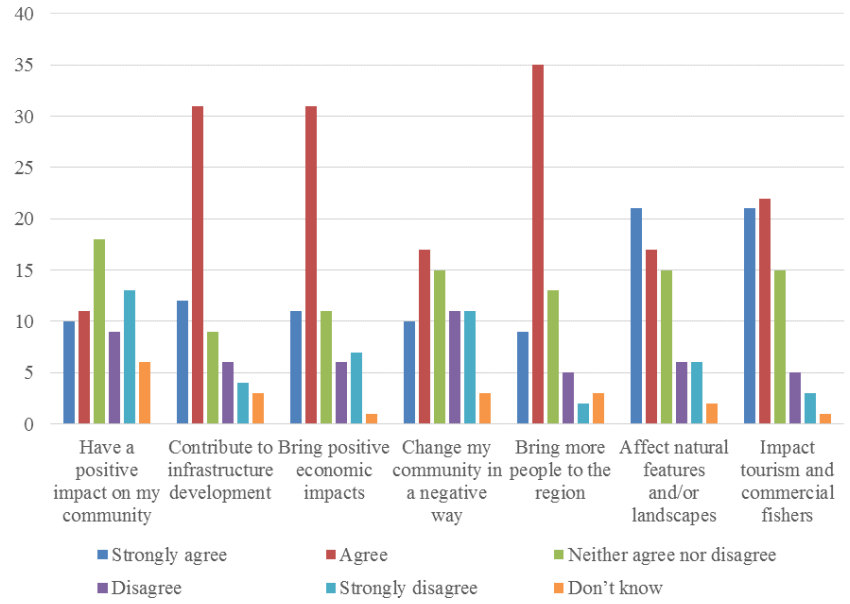

Figure 4. Perceptions of Impacts of Offshore Oil and Gas Exploration and Drilling, and Possible Subsequent Onshore Development. Source: Beer and Thredgold (2017).

Concerns and fears of negative consequences mostly related to the environment. Respondents believed that development in the Great Australian Bight would affect natural features and landscapes, which would potentially have an impact on tourism and commercial fishers. Any disruption to iconic species will have both economic impacts and call into question the 'clean, green' image of the Eyre Peninsula and the Great Australian Bight. Indigenous people, in particular, are believed to be greatly affected by adverse environmental events, and this applies to both those still connected to their traditional country, as well as those moved as a consequence of colonisation and other processes.

The key perceptions as they affect different parts of the regional economy and communities are summarised in Figure 5. Most respondents believed that the development would adversely affect fishing, aquaculture, tourism and Indigenous communities. These sectors were believed to also be further impacted in the event of an oil spill (Figure 5).

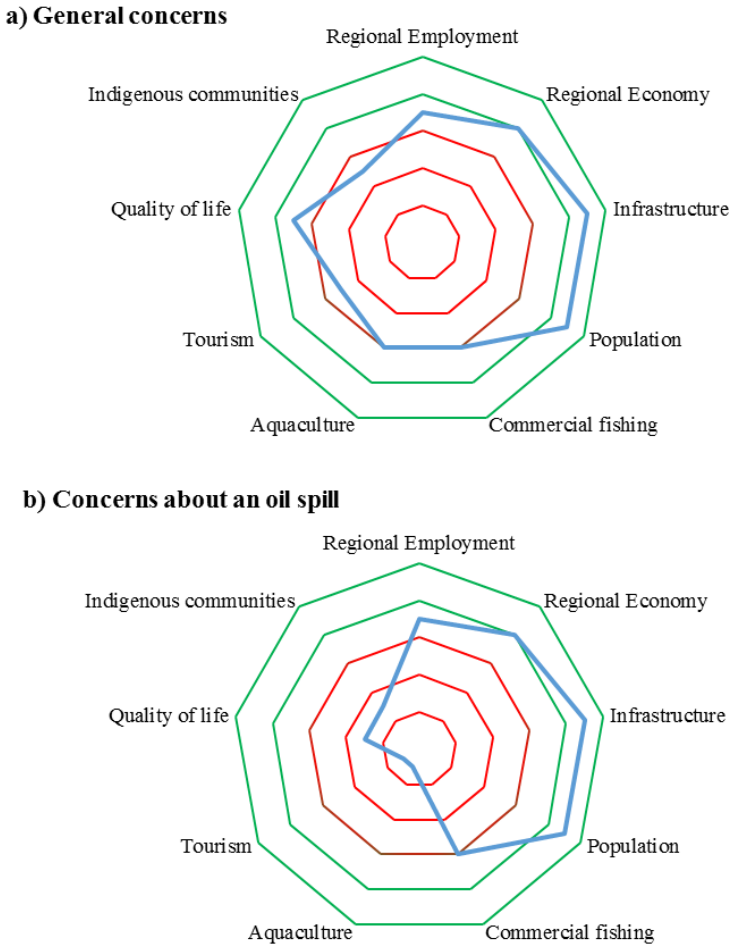

Figure 5. Summary of Perceptions—Conditions Improve (Green) or Worsen (Red). Data Source: Beer and Thredgold (2017).

Support for the potential development in the regions was mixed. Key leaders in the region—including local Members of Parliament and many local government leaders—were broadly supportive of the proposal. The views of local political leaders were unclear, and while key government agencies supported the development, their influence on wider opinion is likely to be limited. Other groups, including a number of industry groups were not supportive, and may actively oppose development. The proposal is likely to have few strong local advocates within the community, partly

because the localised benefits for the region are difficult to identify. Consequently, exploration in the Great Australian Bight is likely to face on-going and strenuous opposition from environmental groups. Indigenous communities are also likely to protest development on cultural, as well as environmental, grounds.

6. DISCUSSION

A common criticism of baseline studies is that they are undertaken without clear objectives, and often just contain a compilation of existing data, much of which may not be relevant for decision making or clearly identify the potential management needs (Wathern, 2004). In this study, attention has focused on the regions, individuals and industries most likely to be impacted by the development of an offshore oil industry, and the production of information that will be relevant to future decision making and impact assessment. Similarly, a criticism of many social impact assessment studies is that they are often no more than a regional profile derived from secondary data (Esteves *et al.*, 2012). In this study, we have incorporated best practice (Moseley, 1996) in terms of incorporating primary data from households, regional decision makers and other stakeholders that are likely to be affected by the development.

For the onshore and fisheries economic baselines, much of the information was already available, but from a wide range of sources that were not necessarily compatible. A major task of the study was the compilation of these data into a form that would be useful for policy makers and developers in planning the future economic development of the region, including but not limited to the development of an oil industry. For the social component, demographic information was also available from a range of sources, but information about the pressures on the region and the drivers of change were not available. The study significantly increased understanding of the regions social and economic environment through primary information collection.

The social and economic systems—both onshore and offshore—were found to have considerable overlap. Employment, incomes and drivers of population change are important components of both the social and economic systems. The region has a strong, export-focussed economy, largely reliant on the production of primary products such as grains, seafood, and livestock. Fisheries are a major source of employment in the region, while recreational fishing is an important contributor to attachment

to the region and sense of place. Fishing also has a cultural significance to the Indigenous population in the region.

The study identified a range of potential positive and negative impacts of the development of an oil industry in the region. Lack of appropriate infrastructure was identified as a major constraint to development in the region, with both social and economic consequences. Many participants in the social component focus groups and surveys had expectations that the development of an oil industry would contribute to the improved development of infrastructure such as roads, rail, port facilities and airports. This in turn would have spin-off effects for tourism (through better access) and the exporting industries, as well as contributing to safety (through better roads) and better access to health services. Further, better airport infrastructure would also facilitate an increase in fly-in-fly-out workers, with possible benefits in terms of being able to expand the mining industry in the region. Expectations of an improved helipad in the western Great Australian Bight was also believed to contribute to safety for the fisheries sector as well as the region through an enhanced rescue facility.

Expectations of a range of alternative employment opportunities were also seen as potential positive impacts from the development. While it was recognised that much of the labour associated with development would most likely be specialised, the increase in population in the region would increase the demand for support services. Population decline in the region is a particular concern, with many of the younger generations leaving the region in search of employment in the major centres. An influx of workers associated with the development of the oil industry would not only increase the population directly, but may also contribute to the retention of many young people who may otherwise leave.

Concern was raised in the social baseline component about the potential environmental consequences of the proposed development, and the effect that this may have on fisheries (both commercial and recreational) and other marine life (particularly whales). The pristine marine environment was a key factor underlying the attachment to the region for many participants. Given the importance of ecotourism to the region, any environmental damage was also considered to have potential negative economic consequences. From a fisheries perspective, the major potential threat was an oil spill, with other (potential) environmental impacts having little direct effect on fisheries production.

7. CONCLUSION

The establishment of environmental and/or ecological baselines is a fundamental and long-established component of environmental impact assessment, and is often a requirement prior to the development of industries with the potential to damage the resource base (e.g. Huguenin *et al*. 1996; UK Onshore Oil and Gas 2015). This study extends this analysis into the social and economic environment, an area not commonly considered but an area that can have substantial impact on the success of any coastal or marine development. In recent years, the importance of developing a social licence to operate has become apparent (Owen and Kemp, 2013; Harvey and Bice, 2014; Voyer *et al.*, 2015); and hence understanding how communities are potentially impacted is an essential part of the development process.

This study provides a snapshot of the social and economic status of the EPWC region, and a Great Australian Bight-wide snapshot of the fishing industry. These snapshots have a limited life as an effective baseline against which changes can be identified. The regional economy is influenced by many external factors, as the effects of the Tasmanian outbreak of POMS demonstrated. Social aspects are potentially less dynamic, although norms and attitudes also change over time (Wathern, 2004). For example, a change in the regional economy due to other factors may shift the demographic characteristics of the region, as well as potentially affect the perception of the opportunities and threats presented by the development of an offshore oil industry. If such a baseline is to remain relevant for assessing the social and economic impacts of the development, ongoing monitoring will be necessary to ensure changes in key communities and industries likely to be impacted due to other factors can be identified. In some cases, the estimation of counterfactuals (i.e. what might have happened if the development had not occurred) may also need to be derived, a process that also has its own challenges (Lotze *et al*., 2006; Huettner *et al*., 2009)

For many, the EPWC offers a high quality of life in a near-pristine environment. However, change has been evident in the communities of the EPWC over the last three decades, including a decline in conventional agriculture, the rise of aquaculture and value-added fishing, and the emergence of mining and tourism, both in the recent past and in prospect. Today, the region has a complex socio-economic structure based on a wide range of industries and communities. However, it is also confronted by

significant challenges including population loss in its interior, restricted water supply, emerging shortages in electricity and other infrastructure, a limited skills base, and out-migration of youth. The decline of some communities within the EPWC was a recurrent theme, with many of the smaller townships and settlements now under threat.

The development of an oil industry in the region offers both opportunities and threats. Expectations about the potential positive impacts of such a development on the regional economies are high and may exceed what can be achieved in terms of increased population, employment and infrastructure development. Similarly, concerns about potential environmental impacts are also significant, although many in the communities are generally supportive of the development.

REFERENCES

Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) (2013). Australian Fisheries Statistics 2012. ABARES, Canberra.

Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) (2015). Australian Fisheries and Aquaculture Statistics 2014. ABARES, Canberra.

Becker, H. A. (2001). Social Impact Assessment. *European Journal of Operational Research*, 128, pp. 311-321.

Beer, A. and Thredgold, C. (2017). Social Profile of the Eyre Peninsula and West Coast region (Final Report GABRP Project 6.1). *GABRP Research Report Series Number 16*. Great Australian Bight Research Program, Adelaide, pp. 98.

Brechin, S. R., Wilshusen, P. R., Fortwangler, C. L. and West, P. C. (2002). Beyond the Square Wheel: Toward a More Comprehensive Understanding of Biodiversity Conservation as Social and Political Process. *Society & Natural Resources*, 15, pp. 41-64.

Deepwater Horizon Natural Resource Damage Assessment Trustees (2016). Deepwater Horizon oil spill: Final Programmatic Damage Assessment and Restoration Plan and Final Programmatic Environmental Impact Statement. National Oceanic and Atmospheric Administration, Silver Spring, MD.

EconSearch (2014a). The Economic Impact of Aquaculture on the South Australian State and Regional Economies, 2012/13. PIRSA Fisheries and Aquaculture, Adelaide.

EconSearch (2014b). Economic Indicators for the Commercial Fisheries of South Australia Summary Report 2012/13. EconSearch, Marryatville, South Australia.

EconSearch (2015a). Economic Indicators for the Charter Boat Fishery 2013/14. EconSearch, Marryatville, South Australia.

EconSearch (2015b). Economic Indicators for the Commercial Fisheries of South Australia Summary Report 2013/14. EconSearch, Marryatville, South Australia.

Esteves, A. M., Franks, D. and Vanclay, F. (2012). Social Impact Assessment: the Atate of the Art. *Impact Assessment and Project Appraisal*, 30, pp. 34-42.

Giri, K. and Hall, K. (2015). South Australian Recreational Fishing Survey 2013/14. Fisheries Victoria Internal Report Series, Melbourne.

Guo, Z., Robinson, D. and Hite, D. (2017). Economic Impact of Mississippi and Alabama Gulf Coast tourism on the Regional Economy. *Ocean & Coastal Management*, 145, pp. 52-61.

Hale, C., Graham, L., Maung-Douglass, E., Sempier, S., Swann, L. and Wilson, M. (2015). Impacts from the Deepwater Horizon Oil Spill on Gulf of Mexico Fisheries. *GOMSG-G-16-002* Gulf of Mexico Research Institute.

Harvey, B. and Bice, S. (2014). Social Impact Assessment, Social Development Programmes and Social Licence to Operate: Tensions and Contradictions in Intent and Practice in the Extractive Sector. *Impact Assessment and Project Appraisal*, 32, pp. 327-335.

Huettner, M., Leemans, R., Kok, K. and Ebeling, J. (2009). A Comparison of Baseline Methodologies for 'Reducing Emissions from Deforestation and Degradation'. *Carbon Balance and Management*, 4, pp. 4.

Huguenin, M. T., Haury, D. H., Weiss, J. C., Helton, D., Manen, C.-A., Reinharz, E. and Michel, J. (1996). Guidance Document for Natural Resource Damage Assessment Under The Oil Pollution Act Of 1990. *NOAA Damage Assessment and Restoration Program*. National Oceanic and Atmospheric Administration, Silver Spring, MD.

Interorganizational Committee on Guidelines and Principles for Social Impact Assessment (1995). Guidelines and Principles for Social Impact Assessment. *Environmental Impact Assessment Review*, 15, pp. 11-43.

Kennedy, C. J. and Cheong, S.-M. (2013). Lost Ecosystem Services as a Measure of Oil Spill Damages: A Conceptual Analysis of the Importance of Baselines. *Journal of Environmental Management*, 128, pp. 43-51.

Lee, M. R. and Blanchard, T. C. (2012). Community Attachment and Negative Affective States in the Context of the BP Deepwater Horizon Disaster. *American Behavioral Scientist*, 56, pp. 24-47.

Lotze, H. K., Lenihan, H. S., Bourque, B. J., Bradbury, R. H., Cooke, R. G., Kay, M. C., Kidwell, S. M., Kirby, M. X., Peterson, C. H. and Jackson, J. B. C. (2006). Depletion, Degradation, and Recovery Potential of Estuaries and Coastal Seas. *Science*, 312, pp. 1806-1809.

Morgan, O. A., Whitehead, J. C., Huth, W. L., Martin, G. S. and Sjolander, R. (2016). Measuring the Impact of the BP Deepwater Horizon Oil Spill on Consumer Behavior. *Land Economics*, 92, pp. 82-95.

Moseley, M.J. (1996). Baseline Studies for Local Rural Development Programmes: Towards a Methodology. *Planning Practice & Research*, 11, pp. 19-36.

O'Neil, M., Trevithick, M., Whetton, S., Wittwer, G. and Young, M. (2016). Economic Baseline and Model Report. GABRP Project 6.2, *GABRP Research Report Series Number 6*. Great Australian Bight Research Program, Adelaide.

Owen, J. R. and Kemp, D. (2013). Social Licence and Mining: A Critical Perspective, *Resources Policy*, 38, pp. 29-35.

Pascoe, S. and Innes, J. (2017). Great Australian Bight Fisheries: Economic and Social Benchmark Study. *GABRP Research Report Series Number 24a*. Great Australian Bight Research Program Adelaide, pp. 41.

Rolfe, J. and Dyack, B. (2011). Valuing Recreation in the Coorong, Australia, with Travel Cost and Contingent Behaviour Models. *Economic Record*, 87, pp. 282-293.

Safford, T. G., Ulrich, J. D. and Hamilton, L. C. (2012). Public Perceptions of the Response to the Deepwater Horizon Oil Spill: Personal Experiences, Information Sources, and Social Context. *Journal of Environmental Management*, 113, pp. 31-39.

Smith, L. C., Smith, M. and Ashcroft, P. (2011). Analysis of Environmental and Economic Damages from British Petroleum's Deepwater Horizon Oil Spill. *Albany Law Review*, 74, pp. 563-585.

UK Onshore Oil and Gas (2015). Guidelines for the Establishment of Environmental Baselines for UK Onshore Oil and Gas. UKGOG, UK.

Vanclay, F. (2003). International Principles For Social Impact Assessment. *Impact Assessment and Project Appraisal*, 21, pp. 5-12.

Vanclay, F. (2012). The Potential Application of Social Impact Assessment in Integrated Coastal Zone Management. *Ocean & Coastal Management*, 68, pp. 149-156.

Voyer, M., Gollan, N., Barclay, K. and Gladstone, W. (2015). 'It's Part of Me'; Understanding the Values, Images and Principles of Coastal Users and their Influence on the Social Acceptability of MPAs. *Marine Policy*, 52, pp. 93-102.

Ward, T. M., Smith, D. C., Lukatelich, R., Lewis, R., Begg, G. A. and Smith, R., (2014). Integrated Approach to Ecological and Socio-Economic Research to Support the Oil and Gas Industry: The Great Australian Bight Collaborative Research Science Program. Proceedings of the International Oil Spill Conference 2014. American Petroleum Institute.

Wathern, P. (2004). *Environmental Impact Assessment: Theory and Practice*. Taylor and Francis (e-Library), London.

Wilson, E. (2016). What is the Social Licence to Operate? Local Perceptions of Oil and Gas Projects in Russia's Komi Republic and Sakhalin Island. *The Extractive Industries and Society*, 3, pp. 73-81.

Zilans, A. and Abolina, K. (2009). A Methodology for Assessing Urban Sustainability: Aalborg Commitments Baseline Review for Riga, Latvia. *Environment, Development and Sustainability*, 11, pp. 85-114.