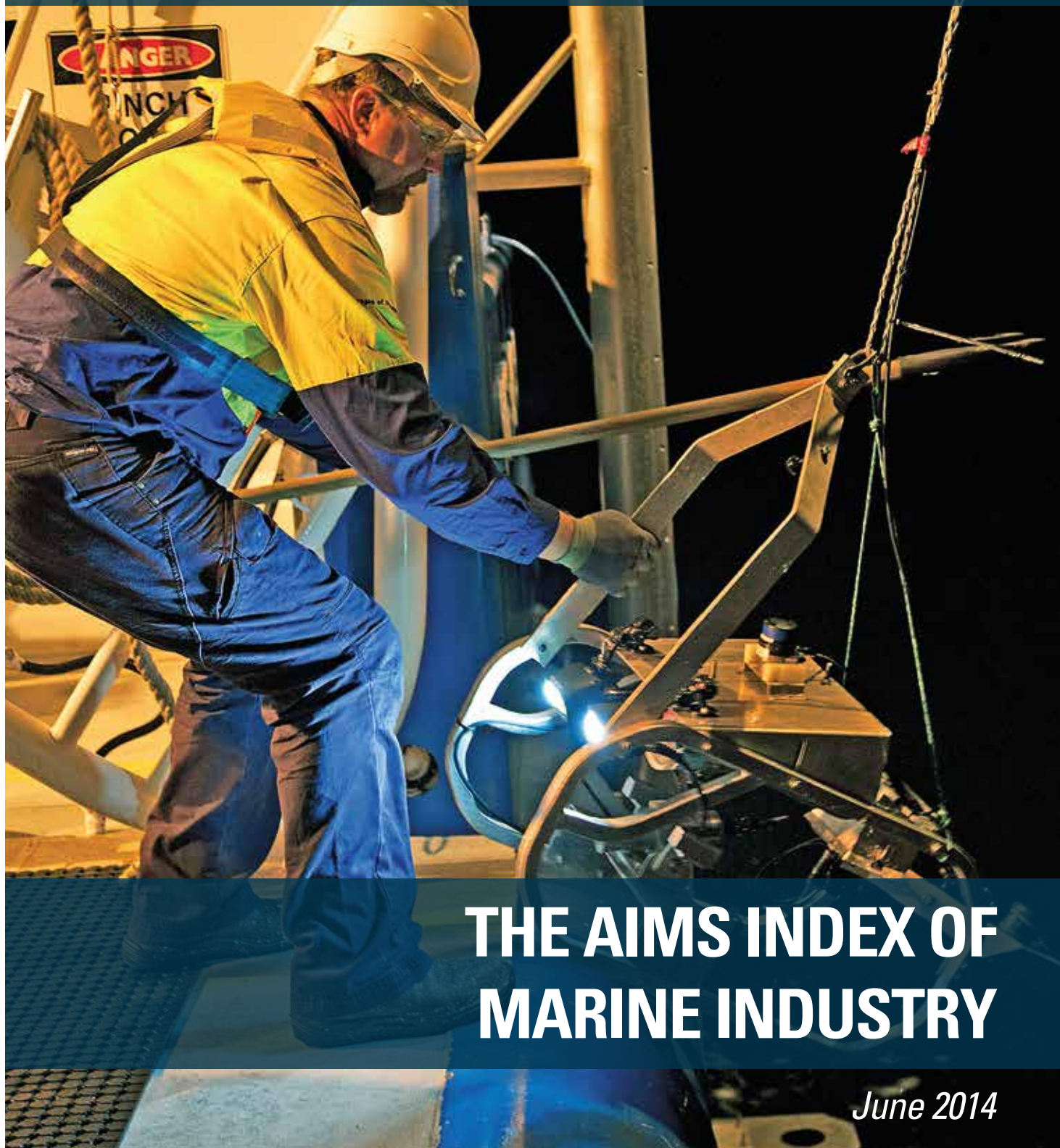




Australian Government



AUSTRALIAN INSTITUTE
OF MARINE SCIENCE



THE AIMS INDEX OF MARINE INDUSTRY

June 2014

AIMS: Australia's tropical marine research agency.

Preface

Australia truly is a marine nation. It has the third largest Exclusive Economic Zone in the world and its total marine territories (10.2 million square kilometres) are 32% larger than the size of the Australian mainland (7.69 million square kilometres).

More than 85 per cent of our population lives within 50 km of the ocean, and more than 70 per cent of Australia's territory is beneath the ocean. It is therefore not surprising to see the important place the ocean plays in defining the national identity of Australians. But our ocean territory is also important as a source of food, in the control of our climate, to the national economy, and to national security.

The oceans surrounding us hold answers to the biggest issues now facing all of humanity: climate and climate change; environmental sustainability; economic growth; national security; energy security and food security. Australia's future and Australia's ocean territories are inextricably linked and yet, despite already making a major contribution to the Australian economy - over \$47 Billion in 2011-12 – much of Australia's ocean territory remains inadequately surveyed and our understanding of the complex interactions that sustain these marine ecosystems is inadequate to provide the certainty sought by both industry and environmental regulators.

The Australian Institute of Marine Science (AIMS) is Australia's tropical marine research agency. Its mission is to generate and transfer the knowledge to support the sustainable use and protection of the marine environment. Our research supports marine policy, evidence-based decisions, and regional industry development by providing independent advice and essential knowledge about tropical marine ecosystems.

The *AIMS Index of Marine Industry* has been developed to provide a regular update of the economic value of Australia's marine environment. It confines its focus to accessible economic data to allow comparison with other economic sectors (e.g. marine based industries already contribute more to the Australian economy than the agricultural sector).

The value of marine based industries has nearly doubled in the last 10 years and is projected to continue to grow. Deloitte Access Economics identifies ocean resources as being one of the top 25 future growth sectors in the Australian economy, with future growth earmarked at 4.4 per cent per annum over the coming years¹. This, together with recent estimates by the Oceans Policy Advisory Group, that predict Australia's oceans will contribute \$100 billion to the Australian economy by 2025² highlight the need for marine research to unlock knowledge and understanding required to support sustainable growth.

It is important to note that the data provided in this report do not include the added value of ecosystems services. A study by the Centre for Policy Development found that our oceans contribute around \$25 billion per year to the economy through ecosystems services³. This is in addition to the economic data and provides further grounds for raising the profile of our marine sector in policy and investment decisions. This is critical if we are to capture the wealth from our oceans.

¹ Deloitte Access Economics (2014) *Positioning for prosperity? Catching the next wave*, March 2014

² Oceans Policy Science Advisory Group. *Marine Nation 2025: Marine science to support Australia's blue economy*. March 2013

³ Eadie L and Hosington C (2011) *Stocking Up: Securing Our Marine Economy*. Centre for Policy Development, September 2011

The economic value of Australia's marine industry

The value of marine industries

Industries associated with Australia's marine environment contribute significant benefits to our economy and society. Despite this, there is not a consolidated 'marine industry' category that reports this contribution to Gross Domestic Product (GDP), Gross State Product (GSP), employment, and infrastructure at a national, State/Territory and regional level.

AIMS has commissioned the analysis in this report to bring together published economic data on the value of the Australian marine industry sector.

This is the fifth edition of the Marine Index. Originally developed for AIMS in 2008 it provides the most recent available assessment of the economic value of the marine industries.

The industry groupings and definitions used in the Index are the same as those used in the previous editions. They were developed through discussion with representatives from a wide range of organisations involved with the marine industries in Australia⁴. Collection of available information for these groupings provides information on the scale of Australia's marine industry and also highlights where information gaps exist in relation to each sub-sector of the marine industry. The industry groupings should be seen as an initial framework for considering the scope and scale of activities which are considered to be part of the 'marine industry'.

Approach to valuation

The main barrier to collecting the consistent and comparable data required to estimate the economic value of Australia's marine industry is that there is no single definition of which activities constitute this sector – that is, there is no agreed 'marine industry' grouping. For example, a number of industry sub-sectors included in the 1997 Marine Industry Development Strategy, which was developed by the Australian Marine Industries and Sciences Council, were excluded from the Marine Industry Action Agenda (developed later by the then Commonwealth Department of Industry, Science and Tourism).

This inconsistency has limited the identification of issues and trends affecting marine-related industries and activities. While a number of studies have estimated the value of marine-related activities at a regional level (in particular, work focussed on the Great Barrier Reef Marine Park), this has not been done at a national level.

In its 2004 report to the National Oceans Office, *The Economic Contribution of Australia's Marine Industries*, the Allen Consulting Group used analysis of previous studies to provide a view of the economic impact of the marine industries. This Index builds on their work to develop a framework which more explicitly accounts for activities within major marine industry groupings.

⁴ AIMS (2008) *Valuing the Australian marine industry: discussion paper*. Produced in conjunction with Deloitte Touche Tohmatsu. Australian Institute of Marine Science, Townsville Queensland.

The Index limits the sub-sector definitions and data sources to quantifiable aspects of activities associated with the marine environment. Data is compiled from sources that are available, comparable and reliable. This necessarily means that economic transactions and industry groupings are emphasised and that data is focussed on value flows rather than on value stocks. Alternative approaches, which would make it possible to think about valuing the social, environmental and other non-tangible dimensions of the marine environment, are not considered in this exercise.

However, more broadly based estimates of economic value that include non-economic data illustrate that the Index is a conservative estimate of the value of Australia's marine based industries. A recent estimate including the value of ecosystems services derived from Australia's oceans added a further \$25 billion per year⁵ – bringing the total value of the marine industry to approximately \$72 billion.

While this approach gives a limited construction of 'valuation', the focus on data that is accessible and repeatable means the performance of the marine industry can be measured and compared over time.

Where possible the data is updated to reflect any changes in the source data that may have occurred between issues.

Value in 2011-12

A summary of the major and most recent available data about marine industry activities in Australia is provided in Tables 1 and 2.

The information summarised in Tables 1 and 2 shows that there are a number of categories for which there is no suitable data available (n/a). However, for sub-sectors where data is available, comparable and reliable, the values have been aggregated to provide a total measurable value for 2011-12 (see Table 3).

Since the previous edition of this report, data has been identified for the value of marinas and boating infrastructure for 2009-10. This "emerging data" is presented in Table 2 but has not been included in the total value for 2010-11 as there is only one year of data available.

⁵ Eadie L and Hosington C (2011) *Stocking Up: Securing Our Marine Economy*. Centre for Policy Development, September 2011

Table 1: Summary statistics for Australian marine industries (marine resource activities and industries), 2011-12.

Marine resource activities and industries				
	Industry Value Added (2011-12 \$m)	Value of Production (2011-12 \$m)	Industry employment (2011-12)	Other
Fishing				
Marine-based aquaculture ⁶	n/a	\$1,054.1		
Commercial fishing (wild capture fisheries) ⁷	n/a	\$1,302.0	6,991 employees (2011-12)	
Recreational fishing ⁸	n/a	n/a (see note below)	n/a	\$2,185.9m (expenditure on related services and products)
Indigenous fishing ⁹	n/a	n/a	In 2000-01, around 37,000 indigenous people participated	2000-01 harvest: 1.89m fish, 0.84m crustaceans, 1.15m molluscs, 0.93m others
Offshore oil & gas exploration and extraction				
Oil exploration ¹⁰	n/a	\$2,246.1		
Oil production ¹¹	n/a	\$9,708.3		
LPG ¹²	n/a	\$971.4*		
Natural gas ¹³	n/a	\$11,949.5*		
Marine pipeline services	n/a	n/a	n/a	
Other resource extraction and use				
Desalination	n/a	n/a	n/a	Emerging industry
Carbon capture	n/a	n/a	n/a	Emerging industry
Bio-prospecting	n/a	n/a	n/a	Emerging industry
Seabed mining	n/a	n/a	n/a	Emerging industry
Tidal power	n/a	n/a	n/a	Emerging industry

* export revenue only

⁶ Australian Bureau of Agricultural and Resource Economics and Sciences, Fisheries Statistics 2012

⁷ Ibid.

⁸ Department of Agriculture, Fisheries and Forestry, National Recreational and Indigenous Fishing Survey 2001 - Note that there is not agreement on whether recreational fishing should be included as a 'marine resource' activity or a 'marine-related service'. Work has recently been undertaken to estimate the value of fish caught by recreational fishers however this has not been at the national level. Expenditure on recreational fishing related services and products, is based on the 2001 survey, with values inflated to 2011-12 dollars.

⁹ Department of Agriculture, Fisheries and Forestry, National Recreational and Indigenous Fishing Survey 2001

¹⁰ Australian Bureau of Statistics, 8412.0 - Mineral and Petroleum Exploration, Australia, December 2013

¹¹ APPEA, Production Statistics 2012, includes extraction from Bass, Gippsland, Bonaparte, Otway, Browse, Carnarvon Basins; and APPEA Financial Survey Results: 2011-12.

¹² Bureau of Resource and Energy Economics, Australian Petroleum Statistics 2012 (Issue no: 197)

¹³ Ibid.

Table 2: Summary statistics for Australian marine industries (marine related service activities and industries), 2011-12.

Marine-related service activities and industries				
	Industry Value Added (2011-12 \$m)	Value of Production (2011-12 \$m)	Industry employment (2011-12)	Other
Boat / ship building, repair & maintenance services and infrastructure				
Shipbuilding & repair (civil and defence) ¹⁴	\$1,195.0	\$2,825.0	8,520 employees	
Boatbuilding & repair (including recreational vessels) ¹⁵	\$441.0	\$1,055.0	6,921 employees	
Marinas and boating infrastructure ¹⁶	n/a	\$769.2	3,800 employees (2010-11)	
Marine equipment retailing ¹⁷	\$214.6	\$2,054.7	2,298 employees	Wages & salaries \$109.8m
Marine tourism and recreational activities				
Cultural & recreational activity ¹⁸	n/a	n/a	n/a	
Domestic consumption of tourism goods and services ¹⁹	\$11,948.8	n/a	156,000 tourism-related employees	40% of domestic tourism
International consumption of tourism goods and services ²⁰	\$2,064.5	n/a	26,000 tourism-related employees	19% of international tourism
Aquaria	n/a	n/a	n/a	
Water transport				
Water transport ²¹	\$1,312.0	n/a	11,000	\$3,904m (income)
Marine environment management				
Scientific research & development	n/a	n/a	n/a	
Establishment & operation of management programs	n/a	n/a	n/a	
Marine safety (Australian Maritime Safety Authority - AMSA) ²²	n/a	n/a	332 AMSA employees	Operating expenditure \$169.4 million

¹⁴ Australian Bureau of Statistics, 81550DO003_201112 Australian Industry, 2011-12

¹⁵ Ibid.

¹⁶ Recreational Marine Research Centre (2011) Health of the Marina Industry Survey, 2011. Statistics for 'Marinas and boating infrastructure' have only recently become available. As such the value of this sector is not included in the value of the Index. However, as more data becomes available over time, it is recommended that this data be incorporated into the index. The only available data is for 2010-11, so the figure for value of production has been inflated to 2011-12 dollars.

¹⁷ IBISWorld Industry Report G5245 Marine Equipment Retailing in Australia 14/03/2014

¹⁸ Including boating/sailing, snorkelling, scuba diving, charter & game fishing by locals

¹⁹ Australian Bureau of Statistics, 5249 - Tourism Satellite Account (2012-13). The percentage allocation of international and domestic tourism related economic activity is based on the calculation in the 1989 Report of the Review committee on Marine Industries, Science and Technology in Australia, Oceans of Wealth? This report used unpublished statistics from the then Bureau of Tourism Research to assess the proportion of visitor nights spent by non-business travellers in places (other than capital cities) where the main attraction is the sea. This share of nights was then used as a proxy for the share of total tourism that the marine tourism industry represents. These figures (19 per cent for international and 40 per cent for domestic) have subsequently been re-used in the Review Committee on Marine Industries and Sciences Council 1997 Report and the Allen Consulting Group's 2004 report to The National Oceans Office, The Economic Contribution of Australia's Marine Industries.

²⁰ Ibid.

²¹ Australian Bureau of Statistics, 81550DO002_201112 Australian Industry, 2011-12

²² Australian Maritime Safety Authority (AMSA) Annual Report, 2012-13

Table 3: Total measurable value from marine-related activities in 2011-12.

Marine resource activities and industries	
Fishing	
Marine-based aquaculture	\$1,054.1m
Commercial fishing (wild capture fisheries)	\$1,302.0m
Offshore oil & gas exploration and extraction	
Oil exploration	\$2,246.1m
Oil production	\$9,708.3m
LPG	\$971.4m*
Natural gas	\$11,949.5m*
Marine-related service activities and industries	
Boat/ship building, repair & maintenance services and infrastructure	
Shipbuilding & repair (civil and defence)	\$2,825.0m
Boatbuilding & repair (incl recreational vessels)	\$1,055.0m
Marine equipment retailing	\$2,054.7m
Marine tourism and recreational activities	
Domestic consumption of tourism goods and services	\$11,948.8m
International consumption of tourism goods and services	\$2,064.5m
TOTAL	\$47,179.4m

* export revenue only

Table 3 suggests that, in 2011-12, the total measurable value of economic activity based in the marine environment in Australia was around \$47.2 billion. By way of comparison:

- The gross value of all agricultural production in Australia in 2011-12 was \$46.7 billion²³
- Sales and service income from motor vehicle and motor vehicle part manufacturing in 2011-12 was \$20.2 billion.²⁴

It should be noted that the value estimate provided is not a complete value – economic data unavailable for many marine activities and there are non-economic values which are not captured by this approach.

Changes over time

In order to form an idea of the sector's performance over time (Figure 1), we compare the levels of economic activity for marine industry sub-sectors, for which reliable data on economic activity is collected annually.

Over the last decade (since 2002-03), the marine industry value has nearly doubled, an increase of 98 per cent. Looking in more detail at the 12 months to June 2012 the value of the sector increased by 7 per cent. This increase was driven by:

- The increase in value of natural gas exports to \$11.9 billion in 2011-12. This a 14 per cent increase over the value of this sector in 2010-11 and a 53% since 2009-10, the period of the last report. Export volumes are projected to increase from 2014-15.
- The increase in value of oil production. This was \$9.7 billion in 2011-12, compared with \$8.5 billion in 2010-11, an increase of \$1.2 billion (15 per cent) although it is just back to 2008-09 production levels.

²³ ABS, 7503.0 -Value of Agricultural Commodities Produced, Australia, 2009-10

²⁴ ABS, 81550 - Australian Industry, 2011-12

- A \$733.9 million increase (6 percent) in marine tourism and recreational activities between 2010-11 and 2011-12 which was mainly driven by an increase in domestic marine tourism. This sector has shown a steady increase over time with an average year on year growth of 6 per cent since 2005-06 and only one year with negative growth (1 per cent contraction between 2007-08 and 2008-09).

Moderating these increases were contractions in the total level of activity in:

- Boatbuilding and repair;
- Oil exploration; and
- LPG.

Overall, the increase in natural gas, oil production and tourism related industries more than offset decreases in other sectors, resulting in an overall increase in the production value of the marine industry of 7 per cent in the 12 months to June 2012. This compares with the Australian economy as a whole, which, in the 12 months to June 2012 grew by 2.8 per cent.²⁵

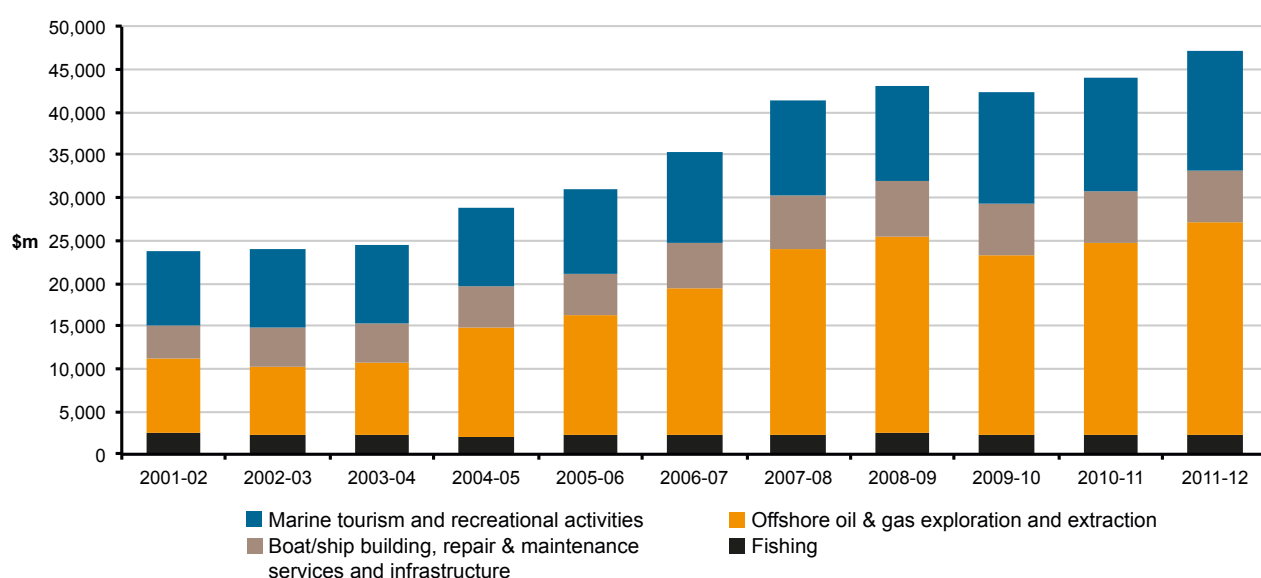


Figure 1: Comparison over time: measurable Industry Value of Production from selected marine-related activities, 2001-02 to 2011-12

Table 4 provides the detailed data for each industry sub-sector's value from 2001-02 to 2011-12. References for this table are the same as those used for Table 2.

²⁵ ABS 5206.0 - Australian National Accounts: National Income, Expenditure and Product, Dec 2013

Table 4: Total of measurable Industry Value of Production from marine-related activities, 2001-02 to 2011-12.

Marine resource activities and industries											
Value of output (\$m)	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12
Fishing											
Marine-based aquaculture*	731.2	708.9	724.6	634.1	742.3	805.7	868.4	866.7	877.6	954.3	1054.1
Commercial fishing (wild capture fisheries)	1783.9	1655.5	1499.2	1490.2	1461.0	1445.9	1362.7	1392.8	1335.0	1316.5	1302.0
TOTAL fishing	2515.1	2364.4	2223.8	2124.9	2203.4	2251.6	2231.0	2470.2	2212.6	2270.8	2356.1
Offshore oil & gas exploration and extraction											
Oil exploration	719.6	922.4	791.2	829.8	937.8	1727.3	2541.1	3318.4	2745.5	2558.9	2246.1
Oil production	4441.0	3472.7	4898.5	7866.6	7570.3	9229.8	12123.6	8637.7	9411.5	8465.3	9708.3
LPG	856.3	981.1	717.3	861.3	1037.1	1038.0	1182.0	1043.5	1105.0	1068.0	971.4
Natural gas (export revenue)	2613.0	2607.0	2174.0	3199.0	4416.0	5220.0	5854.0	10078.7	7788.7	10437.0	11949.5
TOTAL offshore oil & gas	8629.9	7983.2	8581.0	12756.7	13961.2	17215.1	21700.7	23078.4	21051.0	22529.2	24875.3
Boat/ship building, repair & maintenance services and infrastructure											
Shipbuilding & repair (civil and defence)	1796.4	1839.0	1696.0	1721.0	1797.0	1777.0	1954.0	1997.2	2724.0	2722.0	2825.0
Boatbuilding & repair (including recreational vessels)	818.0	1037.0	1108.0	1251.0	1488.0	1688.0	1829.0	1869.4	1207.0	1203.0	1055.0
Marine equipment retailing	1411.6	1632.8	1670.3	1709.6	1743.8	1804.8	2486.8	2559.3	2166.8	2148.7	2054.7
TOTAL boat/ship services	4026.0	4508.8	4474.3	4681.6	5028.8	5269.8	6269.8	6425.9	6097.8	6073.7	5934.7
Marine tourism and recreational activities											
Domestic consumption of tourism goods and services	7336.8	7783.6	7725.6	7909.2	8326.0	9012.4	9553.6	9344.8	11047.6	11235.6	11948.8
International consumption of tourism goods and services	1271.9	1292.2	1376.7	1419.5	1468.7	1611.6	1725.2	1798.5	1963.7	2043.8	2064.5
TOTAL tourism	8608.7	9075.8	9102.3	9328.7	9794.7	10624.0	11278.8	11143.3	13011.3	13279.4	14013.3
TOTAL	23779.6	23932.1	24381.4	28891.8	30988.1	35360.5	41480.3	43117.8	42372.5	44153.2	47179.4

Note: These values have been updated to reflect the most recently available data. Some values may not match quoted values from previous issues of the marine index. Totals have been rounded.

*Calculated using value-added as opposed to value of production.

Marine industry sub-sectors

The following paragraphs outline briefly some of the key issues associated with each of these categories. For further information, see the earlier AIMS discussion paper, *Valuing the Australian marine industry: assessing the scope, scale and value of the Australian marine industry*.²⁶ This paper is available online [here](#).

Commercial fishing and aquaculture

Commercial fishing includes marine-based aquaculture and wild-catch from Commonwealth and State and Territory fisheries. This may mean that data is collected across jurisdictions. Marine-based aquaculture operations are those in coastal waters or in ponds requiring a sea water source – while there are some inland operations using salt water, these are not included in this definition.

Recreational fishing

Quantifying the economic value of recreational fishing is challenging because of the difficulties of collecting and comparing data about activities which occur in a relatively informal way and across a fragmented sector. In addition to any intrinsic environmental or heritage value, the fish caught by recreational fishers could be seen to represent an economic value; they are not, however, part of a market transaction, and determining how much they are worth therefore would require alternative approaches to valuation.

Currently, the only data available about recreational fishing's economic impact is for expenditure on registration fees, ice, bait, fishing/boating/safety equipment, and travel costs. It also includes some activities which could be considered tourism or other services. Using this as the primary economic activity definition, recreational fishing would be considered a marine-related service industry rather than a marine resource industry. This information is based on a study in 2001 that observed that 3.4 million Australian engage in recreational fishing spending \$2.26m annually.²⁷

There have been several more recent studies that have placed an economic value on recreational fishing; however these have been for one particular state or region. For example in 2009 the economic impact of recreational fishing in Victoria²⁸ was valued at \$824 million per annum and more recently, a study on the economic contribution of the Great Barrier Reef Marine Park²⁹ valued the expenditure on recreational fishing in the Great Barrier Reef at \$57.7 million in 2011-12. This recent valuation is a significant reduction on previous reports for the Reef due to a change in methodology to more correctly estimate recreational fishing activity in the region.

Offshore oil and gas exploration, extraction and processing

The energy resources industries – including petroleum, LPG, and LNG – make up a significant portion of marine-based economic activity. In addition to the value arising from the domestic or export sale of resources extracted offshore, which is reliably reflected in production statistics, there is substantial activity generated through exploration and the development and ongoing maintenance of infrastructure (e.g. pipelines).

Other resource extraction

A number of other activities have been identified as emerging industries, with little current impact but the potential for an increasing contribution in the future.

²⁶ AIMS (2008) Op cit.

²⁷ Department of Agriculture, Fisheries and Forestry (2001). *National Recreational and Indigenous Fishing Survey*, 2001

²⁸ Ernst and Young (2009) *Economic Study of Recreational Fishing in Victoria - VRFish*, 20 November 2009

²⁹ Deloitte Access Economics (2013) *Economic contribution of the Great Barrier Reef Marine Park, 2013, Report for the Great Barrier Reef Marine Park Authority*, 2013.

Boat and ship building and maintenance equipment, services and infrastructure

The ANZSIC Manufacturing division includes marine equipment and supplies including activities such as the manufacture of winches, diving equipment, marine engines, acoustics equipment, sails and marine flooring. This is not currently separated out from general transport-related manufacturing.

Marine equipment retailing (ANZSIC 5245) is also in this category, although some activities such as retail of recreational and sporting equipment should be excluded, and counted among the recreational and leisure category.

In addition, this category includes activities in marinas and boating infrastructure. In 2010-11, the Recreational Marine Research Centre released the inaugural Health of the Marina Industry Survey report. The value of this sector is \$769.2 in 2011-12 dollars. This “emerging data” is presented in Table 2 but has not been included in the total value for 2010-11 as there is only one year of data available.

Marine tourism

Assessing the value of marine tourism is perhaps the most challenging part of valuing the marine industries. At the same time, the very substantial contribution of this sector to the economies of marine and coastal communities means that its importance should be recognised.

Identifying tourism activities differs from other industry categorisations, as these activities are defined by the classification of the consumer rather than, as is more typical, of the producer. The ABS develops its tourism satellite account based on internationally agreed standards for measuring tourism activity.³⁰ Internationally, approaches to defining the ‘marine’ components of tourism vary considerably. While there is consensus on approaches to the development of general tourism statistics, there does not yet appear to be a single framework for consistently identifying the portion of this attributable to marine tourism. While the tourism survey made it relatively straightforward to report tourism activity, the contributions in relation to marine tourism should be viewed as broad indicators of economic activity rather than precise estimates. The only existing methodology for this apportionment was developed in the 1989 report *Oceans of Wealth?* This report classified 19 per cent of international and 40 per cent of domestic tourism as marine tourism. It is recommended that further work, perhaps in the form of a survey, should be undertaken to determine an approximate measure for the proportion of Australian domestic tourism which is motivated by marine-related factors.

This grouping should also include marine-related cultural and recreational activity by local people who are not counted in typical ‘tourism’ datasets, including fishing; boating/sailing; snorkelling, scuba diving; charter and game fishing. There is currently no single dataset which identifies this activity. In addition, there is a degree of ‘double counting’ involved in relation to marine tourism and other marine sectors, given that nearly all of the broad (ANZSIC) industry groups are involved to a greater or lesser extent in tourism.

An example where the economic impact of tourism in a specific region has been studied in depth is a recent Deloitte Access Economics report for the Great Barrier Reef Marine Park Authority³¹. This report, an update of a 2006-07 analysis, found that tourism expenditure in the Great Barrier Reef Catchment Area totalled over \$6.4 billion in 2011-12. The report also found that tourism accounted for 91 percent of the following total economic impacts of the Great Barrier Reef:

- direct and indirect national contribution of 68,978 Full Time Equivalent jobs.

³⁰ ABS, 5249.0 - Australian National Accounts: Tourism Satellite Account, 2012-13.

³¹ Deloitte Access Economics (2013) *Economic contribution of the Great Barrier Reef Marine Park, 2013, Report for the Great Barrier Reef Marine Park Authority*, 2013

- Australia-wide contribution to value added of just over \$5.6 billion.

It is likely that for an accurate assessment of the economic impact of marine tourism to be compiled, similar detailed regional studies of major marine based tourism destinations would be required.

Water transport and Services to water transport

The challenge of capturing and appropriately attributing the value of all transport activity that, strictly speaking, occurs in Australia or Australian waters is considerable, given the frequently multinational nature of the transport operators. Therefore, in order to avoid double counting and to present a reliable base line level, this sector is restricted to include only the industry sub-sectors for which the ABS collects data.

Marine environment management

This grouping includes activities which provide management services for the marine environment, including scientific research and development and knowledge transfer, the establishment and operation of environmental management programs, and marine safety activities. In general, the major challenge to establishing the level of activity in this area is that it often occurs in a relatively diffuse way, spread across research institutes, universities, and the national, state, and even local levels of government.

References

Access Economics (2013) *Economic contribution of the Great Barrier Reef, Report for the Great Barrier Reef Marine Park Authority.*

AIMS (2008) *Valuing the Australian marine industry: discussion paper.* Produced in conjunction with Deloitte Touche Tohmatsu. Australian Institute of Marine Science, Townsville Queensland)

Allen Consulting Group (2004) *The Economic Contribution of Australia's Marine Industries, Report to the National Oceans Office.*

Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES)

- *Australian Fisheries Statistics 2012*

Australian Bureau of Statistics (ABS)

- *5206.0 Australian National Accounts: National Income, Expenditure and Product, Jun 2013*
- *7503.0 Value of Agricultural Commodities Produced, Australia, 2011-12*
- *5249.0 Tourism Satellite Account (2012-13)*
- *81550, Australian Industry, 2011-12*
- *8412.0 - Mineral and Petroleum Exploration, Australia, Dec 2013*

Australian Maritime Safety Authority (AMSA) *Annual Report, 2012-13*

Australian Petroleum Production & Exploration Association (APPEA)

- *Financial Survey Results: 2011-12*
- *Production Statistics 2012*

Bureau of Resource and Energy Economics (BREE)

- *Australian Petroleum Statistics – 2012*
- *Australian Petroleum Statistics – 2011*
- *Australian Petroleum Statistics – 2010*
- *Australian Petroleum Statistics – 2009*

Eadie L and Hosington C (2011) *Stocking Up: Securing our marine economy* Centre for Policy Development

Deloitte Access Economics (2014) *Positioning for prosperity? Catching the next wave*

Deloitte Access Economics (2013) *Economic contribution of the Great Barrier Reef Marine Park,*

Department of Agriculture, Fisheries and Forestry (2001) *National Recreational and Indigenous Fishing Survey*

Ernst and Young (2009) *Economic Study of Recreational Fishing in Victoria – VRFish.*

IBISWorld Industry Report (2014) *G5245 Marine Equipment Retailing in Australia*

Oceans Policy Science Advisory Group. *Marine Nation 2025: Marine science to support Australia's blue economy.* March 2013

Recreational Marine Research Centre (2011) *2011 Health of the Marina Industry Survey*