



# Experimental Ecosystem Account for the Great Barrier Reef, Australia

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## Presentation Today

- The Great Barrier Reef
- Scope and coverage
- Ecosystem service valuation methodology
- Provisioning services for agriculture, fishing and aquaculture, and tourism
- Key messages

## [Experimental Ecosystem Account for the Great Barrier Reef](#)



# Great Barrier Reef



- Largest living structure on the planet and one of the few that can be seen from space
- Includes the world's largest coral reef ecosystem, and is composed of 2900 reefs and 900 islands
- Includes 600 types of corals, 100 species of jellyfish, 1625 types of fish, 133 varieties of sharks and rays and 30 species of whales and dolphins
- UNESCO inscribed as World Heritage Area in 1981



# Great Barrier Reef



Increasing concern about sustainability of reef ecosystems due to:

- Pressures from agricultural practices, fishing industry and tourism numbers
- Impact of introduced species
- Climate change



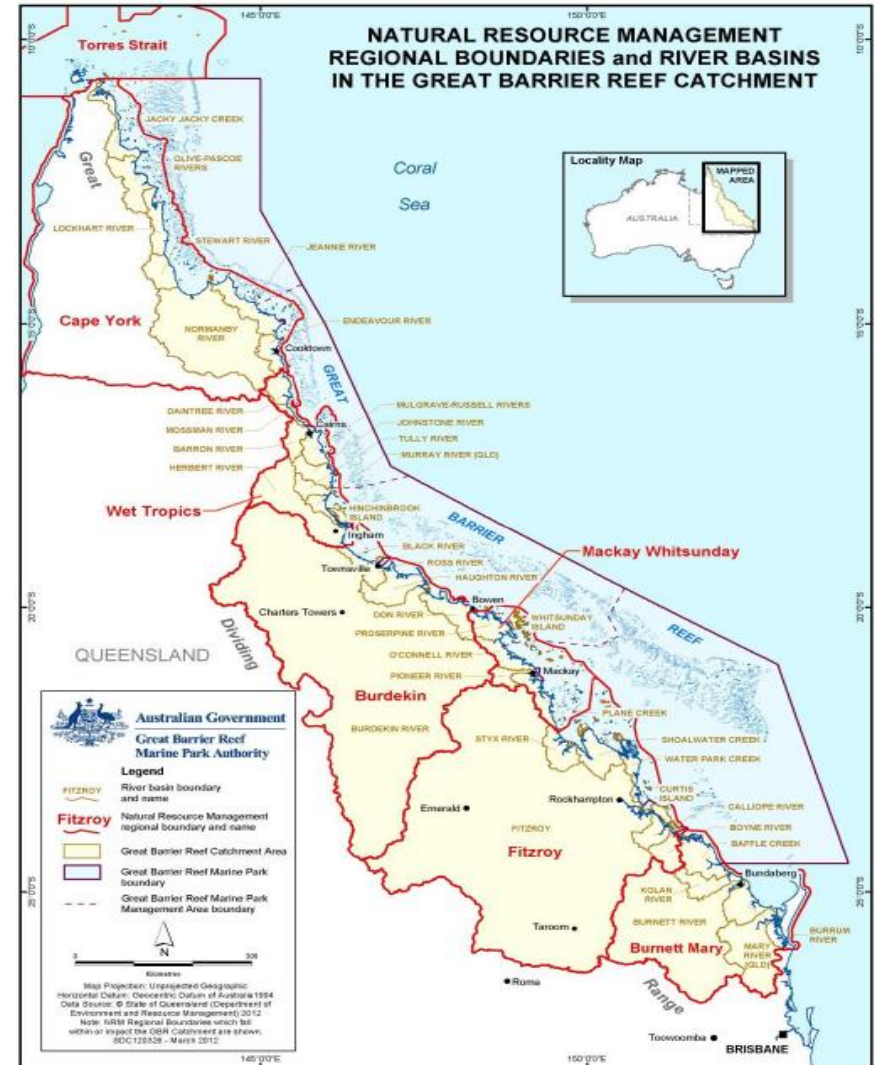


- To test the Experimental Ecosystem Accounting volume of SEEA
- The economic, physical and social interactions within the Great Barrier Reef Region are complex and varied
- There is much data available for the Great Barrier Reef Region, especially environmental data
- Previous ABS work with Queensland Government on Great Barrier Reef Land Account
- Support legislated role of Great Barrier Reef Marine Park Authority
- Significant policy area for both Commonwealth and Queensland state government, as well as community interest



# Spatial Scope

- Terrestrial :5 complete, 1 incomplete NRM regions
- Marine : Entire World Heritage Area



# Valuation of Ecosystem Services

Focus of the Great Barrier Reef Experimental Account was the measurement of provisioning services:

- Agriculture
- Fishing
- Aquaculture
- Tourism



# Ecosystem Service Valuation Methodology

- **unit resource rent** was used to value provisioning services related to the agriculture, aquaculture and fishing industries
- there is a measureable human input in terms of both labour and produced assets which is combined with the relevant ecosystem services to produce a benefit
- the difference between the unit costs of labour and assets and the benefit price represents the **unit resource rent**
- a similar methodology was used to calculate **tourism resource rent**





# Ecosystem Service Valuation Methodology



Data sources for valuing ecosystems:

- ABS Australian National Accounts: Input – Output Tables
- ABS Agricultural Commodities, Australia
- ABS Value of Agricultural Commodities Produced
- Queensland Department of Agriculture and Fisheries
- Tourism Research Australia, National and International Visitors Survey
- Tourism Research Australia, State Tourism Satellite Account

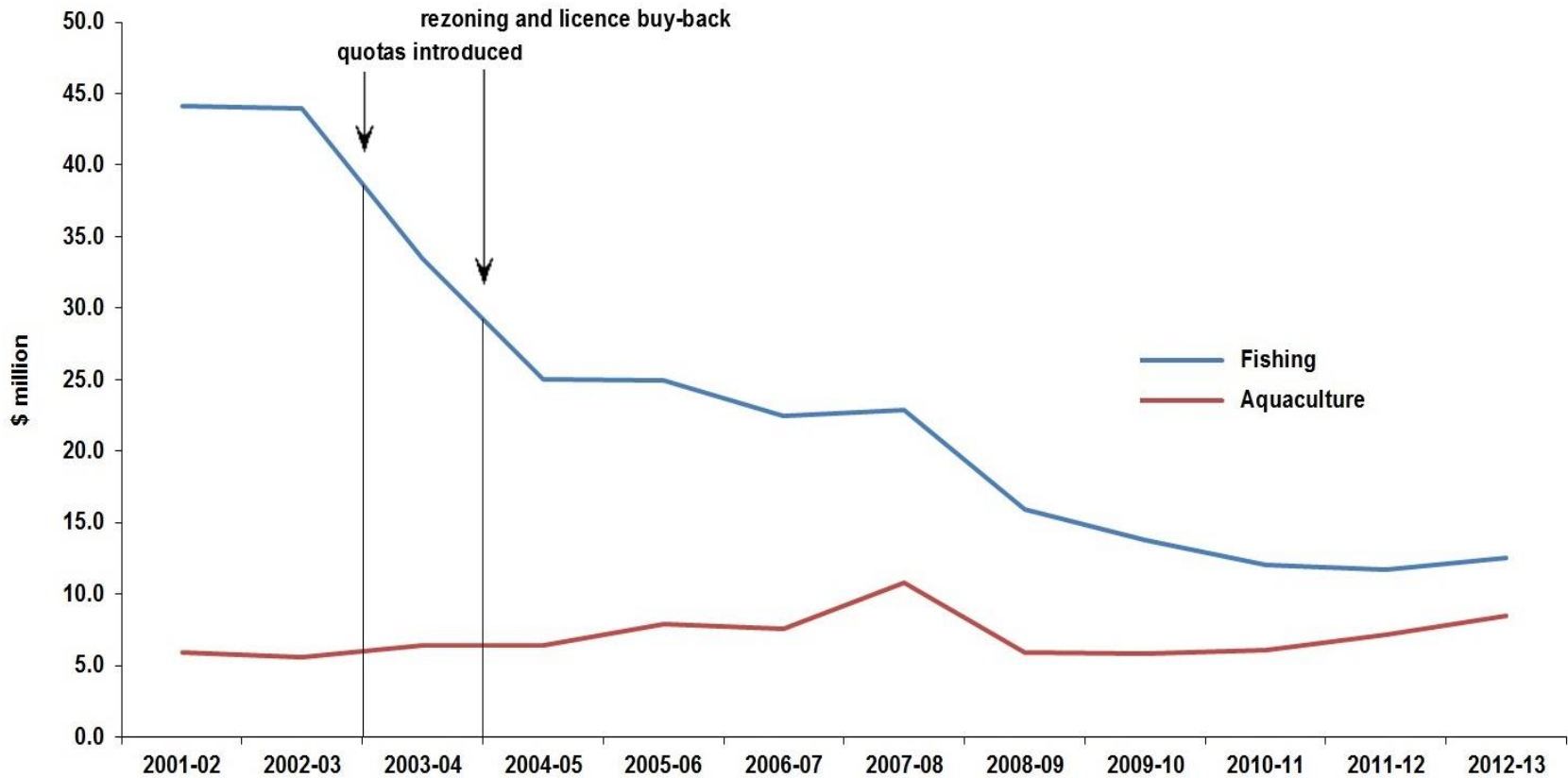


Selected Indicators	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
<b>Total area crops and pastures</b> (sq km)	29 037	28 736	27 893	28 143	28 240	28 759	28 027	28 209	28 058	29 900	30 264	29 704
<b>Share of area devoted to crops and pasture</b> (percentage)	7.6	7.5	7.3	7.3	7.3	7.5	7.3	7.3	7.3	7.8	7.9	7.7
<b>Total food production value</b> (\$m)	na	na	na	na	na	na	4 143	4 351	4 227	3 968	4 196	4 320
<b>Total food production quantity</b> ('000 tonnes)	na	na	na	na	na	na	34 276	31 317	30 813	24 890	25 690	27 603
<b>Total other agricultural production value</b> (\$m)	na	na	na	na	na	na	172.8	205.2	220.4	212.7	301.1	237.3
<b>Total other agricultural production quantity</b> ('000 tonnes)	na	na	na	na	na	na	217	458	166	200	274	271
<b>Agriculture industry regional GOS</b> (\$m)	1 467	1 237	1 390	1 428	1 531	1 483	1 492	1 534	1 608	1 610	1 815	1 906
<b>Ecosystem service value</b> (\$m)	898	753	802	837	858	681	731	804	854	963	1 331	1 344
<b>Ecosystem service as percentage of GOS</b> (percentage)	61.2	60.8	57.7	58.6	56.1	45.9	48.9	52.4	53.1	59.8	73.4	70.5

# Fishing and Aquaculture



## *Ecosystem Service Value, Fishing and Aquaculture*





Selected Indicators	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
<b>Direct tourism consumption</b> (\$ million)	5 627	5 663	5 836	5 888	7 080	8 001	8 364	8 176	8 275	7 658	8 560	8 634
<b>Tourism direct GVA</b> (\$ million)	1 865	1 877	1 935	1 952	2 347	2 653	2 853	2 842	2 949	2 744	3 050	3 077
<b>Tourism rent</b> (\$ million)	285	294	268	262	320	351	379	440	449	453	634	575
<b>Tourism rent as share of tourism GVA</b> (percentage)	15.3	15.7	13.8	13.4	13.6	13.2	13.3	15.5	15.2	16.5	20.8	18.7
<b>Direct tourism employment</b> ('000)	na	na	na	na	na	45.4	46.5	45	44.5	41.4	43.8	43.5
<b>Tourism GVA per tourism employee</b> (dollars)	na	na	na	na	na	58 484	61 364	63 097	66 335	66 216	69 712	70 663
<b>Tourism rent per tourism employee</b> (dollars)	na	na	na	na	na	7 734	8 153	9 769	10 101	10 921	14 486	13 207
<b>Number of visitors</b> (millions)	na	na	na	na	14.8	16.2	16.4	15.9	17.4	15.6	18.8	18.3
<b>Tourism direct GVA per visitor</b> (dollars)	na	na	na	na	158.73	163.29	173.65	178.34	169.86	175.56	162.04	168.45
<b>Tourism rent per visitor</b> (dollars)	na	na	na	na	21.63	21.59	23.07	27.61	25.87	28.96	33.67	31.48

# Key Messages

- The Great Barrier Reef is an important asset that is particularly well suited to this kind of project
- Great Barrier Reef is a region with considerable policy interest
- There is a large store of environmental, economic and social data available for this region
- Building time series data is essential for the accounts to be useful in policy decision making

# Key Messages

- ABS compiled ecosystem service values for agriculture, fishing and aquaculture, and tourism with no direct collection of information
- Resource rent residual derivation method forges a strong link between ecosystem accounting and the System of National Accounts
- Ecosystem service values need to be integrated with a range of physical data to support analyses

