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Carbon Stock Accounting: a report on progress within Australia and estimates of geocarbon

19th meeting of the London Group, 12-14 November 2013

statistics for informed

decision making

Overview

Carbon stock accounts in the SEEA

The need for carbon stock and flow information

Developing carbon stock accounts for Australia

Preliminary estimates of geocarbon stocks for Australia

Questions for London Group

Carbon stock accounts in the SEEA

Briefly mentioned in the SEEA Central Framework

Articulated in the SEEA Experimental Ecosystem Accounts (SEEA EEA) – Table 4.6

- SEEA EEA text also encourages a classification that reflects quality differences among different reservoirs

Carbon stock accounts in the SEEA, continued… (SEEA EEA Table 4.5)

Gigagrams carbon (GgC)		Geocarbon					Biocarbon			Atmosphere	Water in Oceans	Accumulation in economy				TOTAL
		Lime stone	Oil	Gas	Coal	Other	Terrestrial ecosystems	Aquatic ecosystems	Marine ecosystems			Inventories *	Fixed assets	Consumer durables	Waste	
Opening stock																
Additions to stock																
	Natural expansion															
	Managed expansion															
	Discoveries															
	Upwards reappraisals															
	Reclassifications															
	Total additions to stock															
Reductions in stock																
	Natural contraction															
	Managed contraction															
	Downwards reappraisals															
	Reclassifications															
Total reductions in stock																
Imports and exports																
	Imports															
	Exports															
Closing stock																

*Excludes inventories included in biocarbon (e.g. plantation forests, orchards, livestock, etc)

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The need for carbon stock accounts

Kyoto protocol and UNFCCC reporting designed to deliver flow information i.e. GHG emissions to atmosphere

Carbon stock and flow accounts support more complete understanding of the carbon cycle

e.g. at present, certain policies target the biosphere for achieving atmospheric carbon goals

Stock information on the biosphere can inform on how easily carbon moves from biosphere to the atmosphere and elsewhere

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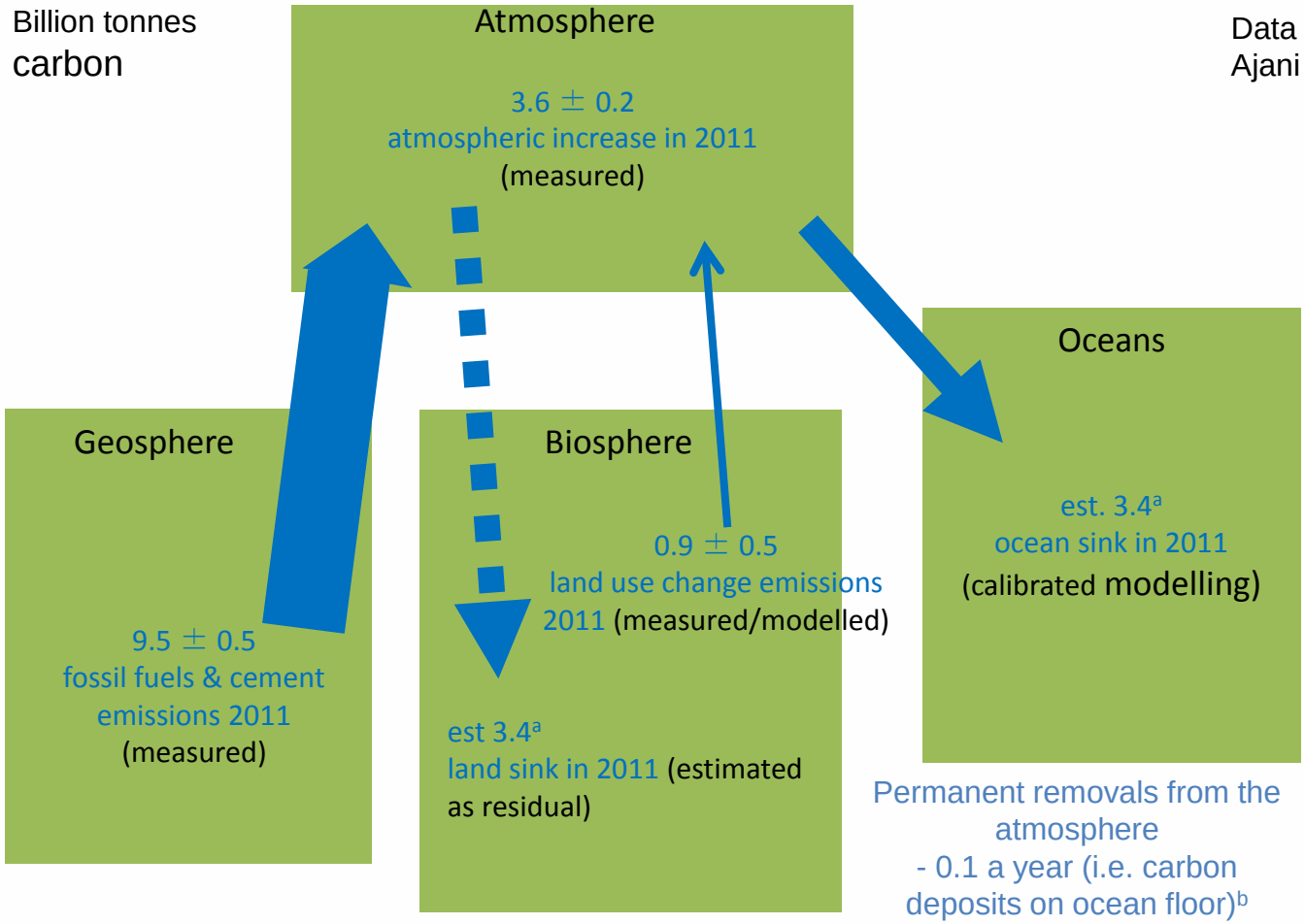
Global carbon flows



Data in this diagram are reproduced from Ajani *et al.* 2013.

a. Applying reported removals of anthropogenic emissions by natural sinks during 2002-2011, in percentage terms.
b. Estimated by Freely *et al*. 2004 as a long term annual average.

Developing carbon stock accounts for Australia

Initiative of the ANU Coombs Policy Forum – collaboration between ANU, ABS and Department of Environment (DoE).
Project objectives:

1. **Identify need for carbon stock accounts**
2. **Experiment to populate SEEA Carbon Stock Account**
3. **Identify research priorities, further refine accounts**
4. **Present findings and recommendations to Australian government (and internationally)**
5. **Assess what is needed for a regular carbon account for Australia**

Developing carbon stock accounts for Australia, *continued…*

A research paper is currently being drafted and relates to the first 3 of these 5 objectives

This paper aims also to provide the following focus points for a workshop of key Australian stakeholders:

- **The need for carbon stock and flow information**
- **Estimating geocarbon and biocarbon**
- **Statistical units, classifications etc, and**
- **Linkages to existing carbon information**

Primary reservoir	Geocarbon Tonnes Carbon (million)	Hectares (million)	Biocarbon Tonnes Carbon (million)		
			Biomass carbon	Soil organic carbon	Total Biocarbon
eocarbon					
Fossil fuel					
Black coal	242300[d]				
Brown coal	278500 [d]				
Crude oil[b]	146				
LPG[c]	91				
Natural gas	1629				
Shale oil	82864				
Total fossil fuel	605530				
Carbonate rocks					
Limestone	n.r.				
Other carbonate rocks	n.r.				
Total carbonate rocks	n.r.				
Other (includes methane clathrates)	n.r.				
iocarbon					
Natural ecosystems					
Rangelands		596.3	X	X	X
Non rangelands:					
Eucalypt native forests		16.7	X	X	X
Shrub lands & woodlands		14.7	X	X	X
Grass, shrub & heath lands		1.6	X	X	X
Rainforests		2.3	X	X	X
Other		0.7	X	X	X
Marine ecosystems		1.8	X	X	X
Fresh water ecosystems		9.9	X	X	X
Total Natural ecosystems		644.0	X	X	X
Semi-natural ecosystems					
Highly modified rangelands		50.0	X	X	X
Grazing in modified pastures outside rangelands		32.9	X	X	X
Total Semi-natural ecosystems		82.9	X	X	X
Agricultural ecosystems					
Cropping		25.5	X	X	X
Irrigated agriculture		2.6	X	X	X
Plantation wood		2.4	X	X	X
Reservoir/dam		0.6	X	X	X
Other		6.3	X	X	X
Total Agriculture ecosystems		37.4	X	X	X
Settlements		2.6	X	X	X
Other		0.5	X	X	X
otal biocarbon		3.1	X	X	X

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Preliminary estimates of geocarbon stocks in Australia

(tonnes million, carbon)

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Questions for London Group

1. Have any other agencies begun work on carbon stock accounts?

2. Are there important information sources that have been overlooked in the Australian work?

3. What should the scope of physical carbon accounts be? (noting that the scope for the SNA is economically demonstrated resources)