Preview of results from a book on valuing the oceans and the economic consequences of action or inaction

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Valuing the Ocean Environment
Economic perspectives

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Valuing the Ocean Environment

Some things are too valuable to be assigned meaningful prices; some questions are too big for meaningful answers. Life as we know it would cease without the ocean: it – and the wondrous variety of life it supports – is literally 'priceless'.

Rather than asking what the ocean itself is worth, this chapter seeks to at least partially answer the question 'what is the value of avoiding further damage to the ocean?'. Or, framing the question another way: 'what is the cost of the environmental damage that could be done to the ocean if we do not take action?'.

The analysis is restricted to five categories of damages that can be priced, and can realistically be affected by policy decisions taken today and in the coming decades. Past damage, and unavoidable future damage that is already in the pipeline, is excluded, as are all fundamentally priceless values. For example, the value of the whale-watching tourism industry can be estimated, but the value of whales themselves cannot. The value of the storm damage protection provided by coastal wetlands can be estimated, but the value of wetlands themselves and the biodiversity they contain cannot.

Awareness of the difference between what we can and cannot change, and what we can and cannot price, is essential to understanding the global costs of inaction.

Pricing the distance between our hopes and our fears

The avoidable portion of future climate damage is in effect the distance between our hopes and our fears. Our hopes are represented by a 'low emissions, low climate impacts' future, our fears by a 'high emissions, high climate impacts' future, based in this analysis on the recently developed IPCC Representative Concentration Pathways RCP2.6 and RCP6 scenarios.

Comparisons to unattainable twentieth-century norms or to an imaginary world with no climate change are effectively pointless. The first scenario, RCP2.6, is a rapid-emission-reduction pathway, whereby temperatures are estimated to reach 2.2°C above pre-industrial levels by 2100. The second, RCP6, is a business-as-usual pathway that sees temperatures rising 4.0°C by 2100. To simplify comparisons, the same projections for global population, GDP and carbon price are used for both scenarios.

Impacts are estimated for five specific categories of ocean services, which have measurable damages that can meaningfully priced. This chapter builds on the analysis of the six specific threats provided in previous chapters, and on the most significant and up-to-date climate economics and science literature from a variety of sources, in order to develop monetary valuations of major impacts on ocean ecosystems and services. It is the difference between the low- and high-climate-impact costs – the avoidable damages – that really counts for policy-makers.

The cost of inaction: Five easy pieces

By 2050, the value of these important climate impacts is estimated to be more than four times higher under a high emissions, high impact scenario. By 2100, the cost of damage if we follow the high emission pathway rises to US$ 1,980 billion, equivalent to 0.37 percent of global GDP. The difference between the two scenarios, or the amount that can be saved by lowering emissions, is US$ 1,367 billion; that is more than a trillion dollars per year by 2100, equivalent to 0.25 percent of GDP.

It is the trillion-plus dollars a year difference that policy-makers should take particular note of, and which should be included in the complex web of climate change accounting. Decisions taken in the coming years will determine whether this figure becomes part of the savings made by rapidly reducing carbon emissions, or is yet another cost of inaction.

Figure 1 VALUATION OF SELECTED CLIMATE IMPACTS ON OCEAN (Billions of 2010 US$)

	Low climate impacts		High climate impacts		Difference	
	2050	2100	2050	2100	2050	2100
Fisheries	67.5	262.1	88.4	343.3	20.9	81.2
Sea-level rise	10.3	34.0	111.6	367.2	101.3	333.2
Storms	0.6	14.5	7.0	171.9	6.4	157.4
Tourism	27.3	301.6	58.3	639.4	31.1	337.7
Ocean carbon sink	0.0	0.0	162.8	457.8	162.8	457.8
Total	**105.7**	**612.2**	**428.1**	**1,979.6**	**322.5**	**1,367.4**
Percent of GDP	*0.06%*	*0.11%*	*0.25%*	*0.37%*	*0.18%*	*0.25%*

Uncertainties, variabilities, unquantifiabilities: The floor is open

At first glance these figures may not make everyone sit up and take notice. Compared to the global economy, they are certainly significant, but they are not so shockingly high that political commitment and public action will necessarily be mobilised to mitigate and adapt to climate change. Indeed, the measure of the problem, and the need for immediate action, cannot be based solely on hard dollar estimates; respect for the priceless value of the ocean, and precautionary responses to the risks of tipping points and catastrophic losses (see Chapter 10) add crucial, qualitatively different dimensions to the story. The figures developed in this chapter are not as staggering as some previous estimates – such as the controversial calculation by Robert Costanza and co-authors in 1997, which valued the ocean at US$ 33 trillion, a figure greater than global GDP at the time – but our aim was to avoid subjective and problematical valuations and provide a basis for continued discussion of the components of the problem that have meaningful prices.

Much is still unknown and uncertain, and this figure represents just a fraction of the ocean services that we know are at risk from avoidable climate damage.

Uncertainty and variability are themselves a challenge, creating a need for adaptation but making it difficult – and very expensive – to achieve. Sadly, it is the poorest countries that are most vulnerable to the impacts of climate change on the ocean. Severe economic problems already being felt include the losses suffered by African and east Asian countries, due to the latitudinal shifts of capture fisheries, the cost of preparing for sea-level rise in countries such as Vietnam and Bangladesh, and the downturns predicted for the tourism industry in the Caribbean and Pacific island nations. Coupling an analysis of these threats with a global-scale economic analysis of the consequences of action or inaction is a huge and ongoing challenge.

In addition to the predictable, measurable risks of gradual change, as discussed in this chapter, a complete economic analysis must also consider the uncertain but potentially catastrophic consequences that could ensue as the world reaches tipping points for climate change. This important topic is the subject of Chapter 10.

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