

AMENDMENTS TO ORIGINAL REPORT

These amendments were made in the course of writing fact sheets and executive summary in November 2010. They are listed for the benefit of users of the original July 2010 report. New readers need not consult this list, as all amendments have been fully incorporated into the November edition.

Minor editing changes and corrected typing errors are omitted. Changes and additions are shown in red.



Page 5, end of first paragraph of Section 1.5: Sentence added:

Voss (1988) gives a classical account of how badly Florida's coral reefs had already degenerated by the late eighties.

Page 7, Section 1.7, last paragraph amended:

Comparing each Part 7 on the Keys scenarios is important, especially the contrast between the global A1 scenario seen to be disastrous if allowed to run its full course, and the global B1 scenario which allows the area to remain viable despite a 38% inundation even under the most optimistic IPCC scenario by the end of the century (the two regionalized scenarios, A2 and B2, are each moderately more pessimistic than the corresponding global A1 and B2).

Page 11, Section 2.2, split second paragraph after "national accounts data". New paragraph:

A report commissioned by French President Nicolas Sarkozy, by Nobel Prize-winning economists Joseph Stiglitz and Amartya Sen and their French colleague Jean-Pierre Fitoussi, represents a major approach to tackle these issues (Stiglitz et al. 2009). Long before, *Genuine Progress Indicators* were developed for the United States and various European countries in the 1990s to try and account for social and environmental constraints to the planet's economic growth. The American GPI shows a steadily growing gap below the conventional GDP between 1950 and 1995, and a significant decline in the GPI since the early 1970s (Victor 2010). If the growing threat from climate change can be adequately measured in an revived GPI, the gap is likely to be considerably wider in 2010. The initiative by Stiglitz, Sen and Fitoussi may spark the development of an superior measure.

Page 15, Section 2.3, new paragraph following first full paragraph (The crucial requirement ...):

The uncertainty calls for urgent rather than delayed (or no) action. Dismissing the evidence because the climate models contain uncertainties goes against any actuarial principles of risk assessment.

Page 17, Section 2.4, first full paragraph, amended as shown:

Two further points should be made. First, despite the apparent current interest of some governments and a large increase in the number of research papers on these technologies (*The Economist* 2010b), large geoengineering "solutions" to the global warming problem noted in Hoegh-Guldberg (2010d) are largely dismissed, mainly because they are highly risky environmentally. In their current undeveloped state they also represent, at most, steps towards mitigation, which are not supposed to be part of the scenarios. One possible technology among these options would be

seeding the stratosphere with sulfur particles to deflect incoming sunlight back into space (Crutzen 2006) – but it is fraught with risks according to the main Royal Society analysis of geoengineering options (Shepherd et al. 2009). In short, options that can be grouped as geoengineering in the sense of significant manipulation of nature are not part of the scenarios (**despite the proliferating research**).

Page 31, last paragraph of Section 4.1.7, amended as shown:

The task force has to prove itself quickly, however. BOCC has resolved that it has a sunset date of October 1, 2010. (**Late addition: This actually happened, but the Board of County Commissioners may reestablish the GITF, or something like it, in 2011. Chris Bergh, personal communication, October 24, 2010.**)

Page 37, Section 4.2.3, second last paragraph, amended as shown:

The carrying capacity study, nonetheless, has been influential in setting boundaries for the growth potential of the Florida Keys, limited by resource constraints. In fact, the population has continued to fall, rather than showing small increases, though this may be **at least partly** due to the influence of the strongly increasing non-resident ownership of condominiums and time-share premises.

Page 39, Section 4.2.5, sentence added, first dot point after “The following points are listed ... :

- Some senior members of the Florida Keys community commented on the great deterioration of the reefs that has occurred since the 1950s-1960s (“shifting baselines”). **This was already a main theme in Gilbert Voss’s book on Florida’s coral reefs (1988).**

Page 42, end of Section 4.2.5 (following dot point 6), two paragraphs added:

A climate action plan for South Florida: As this report was being finalized, the FRRP published a concise climate action plan for 2010-15 for the FKNMS, adjacent national parks and the coral reef areas to the north which together comprise the Florida Reef System. Proposed actions, forty in all, were based on the 2008 Conference findings and a review of relevant literature (FRRP 2010). The regional director of NOAA's Office of National Marine Sanctuaries, Billy Causey, warmly welcomes the plan in a foreword which encapsulates the spirit of constructive cooperation in the area in the face of escalating threats from climate change:

"This Action Plan is the culmination of 5 years of collaborative effort amongst a broad spectrum coral reef scientists, managers, and user groups with some of the most informed individuals in their respective fields. The plan recognizes the need for a holistic approach across the geographic range of Florida's coral habitats given the inevitability of warmer, more acidic oceans, and rising sea levels. It is grounded in the concept of "resilience", or ability of the ecosystem to bounce back from impacts. ..."

Page 43, Section 4.2.6, third dot point (Outfalls from ...), last sentence amended as follows:

- The six ocean outfall pipes in Palm Beach, Miami-Dade and Broward County discharge **a daily average of about 360 million gallons of treated wastewater to the ocean** near the coral reefs of Southeast Florida.

Page 48, last paragraph of Section 4.3.2 amended as follows:

Finally, Florida Bay is 85% part of the Everglades National Park with the remainder mainly under FKNMS. The health of the Bay is vital for the rest of the Florida Keys, as discussed **in Section 5.4.4.**

Page 51, Section 4.4, Paragraph 6, amended as follows:

Of the worldwide non-government organizations that are active in the Florida Keys, TNC (The Nature Conservancy) has already been mentioned. It **started work in the Keys in 1971 and opened its first office there in 1987**. WWF has also traditionally been an important presence.

Page 52, Section 5.2, last paragraph, amended as follows:

Anecdotal evidence **includes older participants at the 2008 scenario-planning workshops (Appendix 2) recalling the 1950s and 1960s**. They said that large reductions of coral cover have also taken place in the Florida Keys. **Voss (1988) supports these impressions**.

Page 98, Section 4.6, final paragraph added:

Late addition, November 2010: The eight attributes in Table 6.28 also scored importance ratings above 4 from residents in 2008, scores that significantly exceeded their satisfaction ratings, especially the assessment of living coral on reefs (importance rating 4.34, satisfaction rating 3.06). Residents placed greater importance than visitors on mooring buoys (a gap of 0.90 scores), variety of fish and sea life (gap 0.41), living coral (gap 0.40), and clear water (gap 0.23). Relative to visitors, residents were least satisfied with the amount of living coral (3.06 against 3.75 for visitors), but they were scored consistently lower on all eight attributes (details in Leeworthy and Morris (2010) and Leeworthy and Ehler (2010a)).

Page 138, Section 7.3.4, beginning of Paragraph 6 amended as shown:

The Deepwater Horizon spill, with its damage to the most important wetlands in the nation, on the coast of Louisiana, and threatening the ecosystems of the Florida Keys and into the wider Caribbean (though this **was largely averted**), ...

Page 151, Section 7.5.5, the end of second full paragraph amended as follows:

... The worst case loses 28% by 2100, mainly in the last quarter of the century. While even this case shows continued growth, it is getting close to zero by 2100, **auguring badly for the next century if allowed to persist**. (7.5.5)

Page 153, Section 7.5.7, final two-line paragraph replaced by the following paragraph:

One observation in Table 7.10 looks surprising but it is based on TNC's empirical work on sea-level rise (Bergh 2009, as reflected in Figure 7.5, Section 7.1.5). Figure 7.10 shows two phases in the inundation process: between 2035 and 2050, and again after 2075. As a result, the remaining area and the population falls to 30% of the 2010 level by the end of the century, compared with 56% for B1. The inference is that it is vital for the Florida Keys to secure a global environmentally benign scenario like B1 as soon as possible. The longer "business-as-usual" behavior drags on, the greater the risk that even the best-case global scenario will be insufficient to save substantial parts of the Keys from the worst excesses of sea-level rise beyond the end of the 21st century.

Page 153, Section 7.6, Paragraph 1, amended as follows:

Figure 7.11 (overleaf) shows the trajectories for all four scenarios on one chart. The indicators are population (number of persons rather than the decline compared to 2010 shown on the previous

graphs), local income relative to 2010, remaining land (which governs population numbers), and coral cover.

Page 157, Section 8.1.1, comment below item 7, last sentence amended as follows:

... As described in Section 4.4, the Florida Keys are fortunate to already have a strong community understanding of the issues, but it is important to encourage even more people to participate.

Additional and amended references

Florida Reef Resilience Program (FRRP 2010), *Climate Action Plan for the Florida Reef System 2010-2015*. With a foreword by Billy D. Causey. June.

<http://frrp.org/SLR%20documents/FL%20Reef%20Action%20Plan-WEB.pdf>.

Leeworthy, V. R. (2010), 'Monroe County Resident Recreation: Selected comparisons 1995-96 and 2008'. October.

<http://sanctuaries.noaa.gov/science/socioeconomic/floridakeys/recreation/linking08a.html>.

Leeworthy, V. R., and R. Ehler (2010a), 'Importance and satisfaction ratings by recreating visitors to the Florida Keys/Key West 2007-08'. July.

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Update in Leeworthy, V. R. (2010), 'Visitor study: Selected comparisons 1995-96 and 2007-08'. July.

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Pachauri, R., and A. Reisinger (ed.) (2007), *Climate Change 2007: Synthesis Report*. IPCC.

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Shiva, V. (2005), 'Two myths that keep the world poor.' *Ode*. November.

http://www.odemagazine.com/doc/28/two_myths_that_keep_the_world_poor/.

The Economist (2010b), 'Geoengineering: Lift-off'. London, November 4.

Victor, P. (2010), 'Questioning economic growth'. *Nature*, Vol. 468, November 18.

Voss, G. V. (1988), *Coral Reefs of Florida*. Pineapple Press, Sarasota, Florida.