

1 **Appendix 6: Topics for Consideration in Future Assessments**

2 Although this report covers a broad range of topics related to understanding, assessing,
3 and responding to global change as required by the GCRA,¹ it is not possible to provide a
4 comprehensive analysis of every topic in a single report. The following are important
5 topics that could not be adequately covered in this report. In preparation for future
6 synthesis reports, there are some topics that could be considered.

7 **Economic Analyses**

8 Documenting the costs of climate change impacts is extremely challenging, because these
9 impacts occur across multiple regions and sectors and over multiple time frames. The
10 impacts include physical, ecological, and social components, and many are difficult to
11 extract from underlying sources of vulnerability not caused by climate change. Also,
12 while some types of extreme weather events are made more frequent and/or intense by
13 climate change, it is rare that any event has a single cause. Since such events generally
14 result from a combination of natural variability and climate change, it is difficult to
15 assign a precise proportion of the costs associated with a particular event to climate
16 change. Further, many impacts occur in ways that are difficult to translate into precise
17 economic costs; for example, impacts to biodiversity, changes in quality of life, or social
18 stresses are likely to be valued differently by different individuals and communities.
19 Finally, it is challenging to assess the economic implications of rare events, which have
20 low probability but high consequence – especially in cases where there is limited or non-
21 existent data about the costs of such events in the past.

22 A number of studies have produced estimates of the economic damages expected from
23 future climate change. However, there are currently no total economic damage estimates
24 that are based on valuing and aggregating the various regional and sectoral impacts that
25 are the focus of this assessment. Understanding these impacts in more detail could
26 provide important input for adaptation and mitigation decisions.

27 **National Security**

28 The implications of climate change for U.S. national security are significant, but they
29 have not been analyzed in detail in this report because there are a number of recent
30 unclassified Department of Defense (DoD) reports and reports of other groups that have
31 rigorously addressed this topic. In 2010, the Department of Defense released the
32 Quadrennial Defense Review (QDR), for the first time acknowledging that climate
33 change will play a “significant role in shaping the future security environment.”² Based
34 on the QDR, the DoD is now incorporating and considering the consequences of climate
35 change in its long-range strategic plans, including potential impacts to its facilities and
36 missions. Other recent reports by the National Intelligence Council and the National
37 Research Council analyze the security implications of climate change.³ The NRC found
38 that “It is prudent to expect that over the course of a decade some climate events... will
39 produce consequences that exceed the capacity of the affected societies or global systems
40 to manage and that have global security implications serious enough to compel
41 international response.” National security concerns are highly integrated with a variety of
42 other economic, health, policy and resource management issues. The findings of the
43 National Climate Assessment reports, as well as other environmental assessments, are

1 influential in determining threats to national security; it will be useful in future reports to
2 advance the state of knowledge of climate impacts and how they are integrated in
3 complex ways with national security concerns and emergency preparedness.

4 **Interactions between Adaptation and Mitigation Activities**

5 An additional topic that requires further investigation is the state of knowledge of the
6 intersections of adaptation and mitigation activities. Although adaptation, preparedness,
7 and resilience are all related concepts, the emissions implications across the life of an
8 adaptation project, including full assessment of the emissions associated with “supply
9 chains” for manufactured goods and services, are difficult to assess for any project, and
10 even more challenging on larger scales. In addition, there are options where mitigation
11 and adaptation strategies have co-benefits, and other combinations of strategies that can
12 cause unintended negative consequences. For example, the water resource implications of
13 increased production of biofuels are substantial in some regions of the U.S., and may
14 result in negative impacts on ecosystems, power production, or residential water supply
15 (See Ch. 6: Agriculture; Ch. 10: Energy, Water, and Land; Ch. 27: Mitigation; and Ch.
16 28: Adaptation). It would be useful to explore these and related topics in more detail in
17 future assessments.

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References

1. GCRA, 1990: Global Change Research Act (Public Law 101-606 404, Stat. 3096-3104), signed on November 16, 1990. [Available online at <http://www.gpo.gov/fdsys/pkg/STATUTE-104/pdf/STATUTE-104-Pg3096.pdf>]
 2. DOD, 2010: Quadrennial Defense Review, 128 pp., U.S. Department of Defense. [Available online at <http://www.defense.gov/qdr/qdr%20as%20of%2029jan10%201600.pdf>]
 3. Fingar, T., 2008: National intelligence assessment on the national security implications of global climate change to 2030, 21 pp., U.S. Office of the Director of National Intelligence. [Available online at http://www.fas.org/irp/congress/2008_hr/062508fingar.pdf];
- NRC, 2013: *Climate and Social Stress: Implications for Security Analysis*. National Research Council. The National Academies Press. [Available online at http://www.nap.edu/openbook.php?record_id=14682]

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