

IPCC Report on Climate Change 2014: Impacts, Adaptation, and Vulnerability Summary for Policymakers

Section A: Observed Impacts, Vulnerability, & Adaptation in a Complex & Changing World

1. Give 2 examples of altered hydrological systems.
2. There is “high confidence” that many terrestrial, freshwater and marine species have shifted their geographic ranges in response to climate change. Explain the meaning of the following statement: *“While only a few recent species extinctions have been attributed as yet to climate change, natural global climate changes at rates slower than current anthropogenic climate change caused significant ecosystem shifts and species extinctions during the past millions of years.”*
3. Impacts from recent climate-related extremes, such as heat waves, droughts, floods, cyclones, and wildfires, reveal significant vulnerability and exposure of some ecosystems and many human systems to current climate variability. Give 4 examples of such climate-related activities.
4. Figure SPM.2: Part A
 - a. Which half of the US (east or west) shows a major contribution of climate change for rivers, lakes, floods, and/or droughts?
 - b. With what level of confidence is that made?
5. Using Figure SPM: Part B, what do positive distribution changes (greater distribution) indicate? Name at least 5 groups with positive change.
6. A-2: Adaptation experience is accumulation across regions.
 - a. Which area has the best plans for sea level rise?
 - b. Which area has an ecosystem-based adaptation plan?
 - c. Name at least 2 areas in which Asia is taking adaptation action.
7. Using figure SPM.3, describe the Risk Management Process portrayed in the diagram.
8. Figure SPM.4, Part A:
 - a. What part of the US did not have a statistically significant trend? What about the rest of the US?
 - b. Where in the world was the greatest change observed?
9. Using Figure SPM.4, Part B & C, use these two diagrams to formulate a statement of future climates (2081-2100) in both a low & high emission scenario.
10. What are some of the factors that complicate future vulnerability, exposure, and response capacity of human and natural systems?

Section B: Future Risks and Opportunities for Adaptation

11. Using Assessment Box SPM.1, assess each of the following;
 - a. unique and threatened systems –
 - b. extreme weather events –
 - c. distribution of impacts –
 - d. global aggregate impacts –
 - e. large-scale singular events –

12. Rank these 8 risks with the greatest as #1 and the lowest as #8. (RFC = Reason For Concern)

____ Risk of death, injury, or disrupted livelihoods in low-lying coastal zones and small island developing states and other small islands, due to storm surges, coastal flooding and sea level rise

____ Risk of severe ill-health and disrupted livelihoods for large urban populations due to inland flooding in some regions

____ Systemic risks due to extreme weather events leading to breakdown of infrastructure networks and critical services such as electricity, water supply, and health and emergency services.

____ Risk of mortality and morbidity during periods of extreme heat, particularly for vulnerable urban populations and those working outdoors in urban or rural areas

____ Risk of food insecurity and the breakdown of food systems linked to warming, drought, flooding and precipitation variability and extremes, particularly for poorer populations in urban and rural settings

____ Risk of loss of rural livelihoods and income due to insufficient access to drinking and irrigation water and reduced agricultural productivity, particularly for farmers and pastoralists with minimal capital in semi-arid regions

____ Risk of loss of marine and coastal ecosystems, biodiversity and the ecosystem goods, functions and services they provide for livelihoods

____ Risk of loss of terrestrial and inland water ecosystems, biodiversity and the ecosystem goods, functions, and services they provide for livelihoods

Section B-2. Sectoral Risks and Potential for Adaptation:

Write a summary statement that details the risk to each of these:

13. Freshwater Resources –

14. Terrestrial & Freshwater Ecosystems –

15. Coastal Systems and Low-lying Areas –

16. Marine Systems –

17. Food security & Food Production Systems –

18. Urban Areas –

19. Rural Areas –

20. Key Economic Sectors & Services –

21. Human Health –

22. Human Security –

23. Livelihoods & Poverty –

Assessment Box SPM.2, Table 1

List the climatic drivers for each key risk in the tables below.

22. Africa

Key Risk	Climatic Drivers
Compounded stress on water resources	
Reduced crop productivity	
Changes in range of vector & water-borne diseases	

23. Europe

Key Risk	Climatic Drivers
Increased economic loss & people affected by flooding	
Increased water restrictions	
Increased economic loss & people affected by extreme heat events	

24. Asia

Key Risk	Climatic Drivers
Increased riverine, coastal, and urban flooding leading to widespread damage	
Increased risk of heat-related mortality	
Increased risk of drought-related water & food shortage causing malnutrition	

25. North America

Key Risk	Climatic Drivers
Wildfire-induced loss of ecosystem integrity, property loss, human morbidity & mortality	
Heat-related human mortality	
Urban floods in riverine & coastal areas, inducing property & infrastructure damage	

26. Central & South America

Key Risk	Climatic Drivers
Water availability in semi-arid & glacier melt, also flooding & landslides	
Decreased food production & food quality	
Spread of water-borne diseases in altitude and latitude	

27. Small Islands

Key Risk	Climatic Drivers
Loss of livelihoods, coastal settlements, infrastructure, ecosystem services and economic stability	
Interaction of rising global mean sea level in the 21 st century with high water-level events will threaten low-lying coastal areas	

28. Ocean

Key Risk	Climatic Drivers
Distributional shift in fish & invertebrate species & decrease in fisheries catch	
Reduced biodiversity, fisheries abundance, and coastal protection by coral reefs	
Coastal inundation and habitat loss due to sea level rise, extreme events, changes in precipitation & reduced ecological resilience	

Section C: Managing Future Risks and Building Resilience

29. What is considered the first step towards adapting to future climate change?

30. Using Table SPM.1, what methods (more than 1) could be used to manage risks of climate change for:

a. human development –

b. ecosystem management –

c. structural/physical damage:

i. engineered options –

ii. technological options –

iii. ecosystem-based –

iv. services –

31. What could result from poor planning and failing to anticipate consequences?
(need more than 1 word)

Use Table SPM.A1 to provide evidence for each of the following and list only the high confidence evidence for each of these impacts.

32. Africa

a. snow & ice, rivers & lakes, floods & droughts –

b. coastal erosion & marine ecosystems –

33. Europe

- a. snow & ice, rivers & lakes, floods & droughts –
- b. terrestrial ecosystems –
- c. coastal erosion & marine ecosystems –

34. Asia

- a. snow & ice, rivers & lakes, floods & droughts –
- b. terrestrial ecosystems –
- c. coastal erosion & marine ecosystems –

35. Australia

- a. snow & ice, rivers & lakes, floods & droughts –
- b. terrestrial ecosystems –
- c. coastal erosion & marine ecosystems –

36. North America

- a. snow & ice, rivers & lakes, floods & droughts –
- b. coastal erosion & marine ecosystems –

37. Central & South America

- a. snow & ice, rivers & lakes, floods & droughts –
- b. coastal erosion & marine ecosystems –

38. Polar Regions

- a. snow & ice, rivers & lakes, floods & droughts –
- b. terrestrial ecosystems –
- c. coastal erosion & marine ecosystems –

39. Small Islands

- a. coastal erosion & marine ecosystems –

40. Summarize these two quotes in your own words.

“We live in an era of man-made climate change,” said Vicente Barros, Co-Chair of Working Group II. “In many cases, we are not prepared for the climate-related risks that we already face. Investments in better preparation can pay dividends both for the present and for the future.”

“The report concludes that people, societies, and ecosystems are vulnerable around the world, but with different vulnerability in different places. Climate change often interacts with other stresses to increase risk,” according to Chris Field, Co-Chair of Working Group II.