

The U.S. Climate Change Science Program

Table 1: Summary of Synthesis and Assessment Products

CCSP GOAL 1	TOPICS FOR PRIORITY CCSP SYNTHESIS PRODUCTS	SIGNIFICANCE	COMPLETION
	Temperature trends in the lower atmosphere —steps for understanding and reconciling differences.	Inconsistencies in the temperature profiles of different data sets reduce confidence in understanding of how and why climate has changed.	within 2 years
	Past climate variability and change in the Arctic and at high latitudes.	High latitudes are especially sensitive and may provide early indications of climate change; new paleoclimate data will provide long-term context for recent observed temperature increases.	within 2 years
	Reanalyses of historical climate data for key atmospheric features. Implications for attribution of causes of observed change.	Understanding the magnitude of past climate variations is key to increasing confidence in the understanding of how and why climate has changed and why it may change in the future.	2-4 years
CCSP GOAL 2	TOPICS FOR PRIORITY CCSP SYNTHESIS PRODUCTS	SIGNIFICANCE	COMPLETION
	Updating scenarios of greenhouse gas emissions and concentrations, in collaboration with the CCTP. Review of integrated scenario development and application.	Sound, comprehensive emissions scenarios are essential for comparative analysis of how climate may change in the future, as well as for analyses of mitigation and adaptation options.	within 2 years
	North American carbon budget and implications for the global carbon cycle.	The buildup of CO ₂ and methane in the atmosphere and the fraction of carbon being taken up by North America's ecosystems and coastal oceans are key factors in estimating future climate change.	within 2 years
	Aerosol properties and their impacts on climate.	There is a high level of uncertainty about how climate may be affected by different types of aerosols, both warming and cooling, and thus how climate change might be affected by their control.	2-4 years
	Trends in emissions of ozone-depleting substances, ozone layer recovery, and implications for ultraviolet radiation exposure and climate change.	This information is key to ensuring that international agreements to phase out production of ozone-depleting substances are having the expected outcome (recovery of the protective ozone layer).	2-4 years
CCSP GOAL 3	TOPICS FOR PRIORITY CCSP SYNTHESIS PRODUCTS	SIGNIFICANCE	COMPLETION
	Climate models and their uses and limitations, including sensitivity, feedbacks, and uncertainty analysis.	Clarifying the uses and limitations of climate models at different spatial and temporal scales will contribute to appropriate application of these results.	within 2 years
	Climate projections for research and assessment based on emissions scenarios developed through CCTP.	Production of these projections will help develop modeling capacity and will provide important inputs to comparative analysis of response options.	2-4 years
	Climate extremes including documentation of current extremes. Prospects for improving projections.	Extreme events have important implications for natural resources, property, infrastructure, and public safety.	2-4 years
	Risks of abrupt changes in global climate.	Abrupt changes have occurred in the past and thus it is important to evaluate what we know about the potential for abrupt change in the future.	2-4 years

Table 1 (continued)

CCSP GOAL 4		
TOPICS FOR PRIORITY CCSP SYNTHESIS PRODUCTS	SIGNIFICANCE	COMPLETION
Coastal elevation and sensitivity to sea-level rise.	Evaluation of how well equipped society is to cope with potential sea-level rise can help reduce vulnerability.	within 2 years
State-of-knowledge of thresholds of change that could lead to discontinuities (sudden changes) in some ecosystems and climate-sensitive resources.	This approach seeks to determine how much climate change natural environments and resources can withstand before being adversely affected.	2-4 years
Relationship between observed ecosystem changes and climate change.	Earlier blossoming times, longer growing seasons, and other changes are being observed, and this report will explore what is known about why these events are happening.	2-4 years
Preliminary review of adaptation options for climate-sensitive ecosystems and resources.	Understanding of adaptation options can support improved resource management—whether change results from natural or human causes—and thus helps realize opportunities or reduce negative impacts.	2-4 years
Scenario-based analysis of the climatological, environmental, resource, technological, and economic implications of different atmospheric concentrations of greenhouse gases.	Knowing how well we can differentiate the impacts of different greenhouse gas concentrations is important in determining the range of appropriate response policies.	2-4 years
State-of-the-science of socioeconomic and environmental impacts of climate variability.	This product will help improve application of evolving ENSO forecasts by synthesizing information on impacts, both positive and negative, of variability.	2-4 years
Within the transportation sector, a summary of climate change and variability sensitivities, potential impacts, and response options.	Safety and efficiency of transportation infrastructure—much of which has a long lifetime—may be increased through planning that takes account of sensitivities to climate variability and change.	2-4 years
CCSP GOAL 5		
TOPICS FOR PRIORITY CCSP SYNTHESIS PRODUCTS	SIGNIFICANCE	COMPLETION
Uses and limitations of observations, data, forecasts, and other projections in decision support for selected sectors and regions.	There is a great need for regional climate information; further evaluation of the reliability of current information is crucial in developing new applications.	within 2 years
Best-practice approaches to characterize, communicate, and incorporate scientific uncertainty in decisionmaking.	Improvements in how scientific uncertainty is evaluated and communicated can help reduce misunderstanding and misuse of this information.	within 2 years
Decision support experiments and evaluations using seasonal to interannual forecasts and observational data.	Climate variability is an important factor in resource planning and management; improved application of forecasts and data can benefit society.	within 2 years

