***Why were these documents produced?***

These documents were produced to provide information that can be used in support of the activities of the National Climate Assessment (NCA). One specific activity is the development of the 2013 NCA report and this was the immediate motivation for these climate scenarios documents. In the longer-term as part of a sustained assessment focus, it is intended that these documents will be updated as new and well-vetted model results are available and as new climate scenario needs become clear. It is also hoped that these documents (and associated data and resources) will be used by a broader community and be of direct benefit to decision makers and communities seeking information in developing adaptation plans.

***What do these documents address?***

There are nine reports in this series, one each for eight regions defined by the NCA, and one for the contiguous U.S. The eight NCA regions are the Northeast, Southeast, Midwest, Great Plains, Northwest, Southwest, Alaska, and Hawai‘i/Pacific Islands.

These documents include a description of the observed historical climate conditions for each region and a set of climate scenarios as plausible futures. While the datasets and simulations in these regional climate documents are not, by themselves, new, (they have been previously published in various sources), these documents represent a more complete and targeted synthesis of historical and plausible future climate conditions around the specific regions of the NCA.

## ***What is the basis for the historical climate descriptions?***

The description of the historical climate conditions was based on an analysis of core climate data (the data sources are available and described in each document). However, to help understand, prioritize, and describe the importance and significance of different climate conditions, additional input was derived from climate experts in each region, some of whom are authors on these reports. In particular, input was sought from the NOAA Regional Climate Centers and from the State Climatologists. The historical climate conditions are meant to provide a perspective on what has been happening in each region and what types of extreme events have historically been noteworthy, to provide a context for assessment of future impacts.

## ***What is the purpose of the future scenarios description?***

The future climate scenarios are intended to provide an internally consistent set of climate conditions that can inform analyses of potential impacts of climate change. The scenarios are not intended as projections as there are no probabilities for their future realization attached. They simply represent an internally consistent climate picture under certain assumptions about the future pathway of greenhouse gas emissions. By “consistent” we mean that the relationships among different climate variables and the spatial patterns of these variables derive directly from the same set of climate model simulations and are therefore physically plausible.

***What is the basis for the future climate scenarios information?***

The future climate scenarios are based on well-established sources of information. No new climate model simulations or downscaled data sets were produced for use in these reports. Based on the decisions of the National Climate Assessment Development and Advisory Committee (NCADAC), the climate model simulations used in these documents are based on the A2 emissions scenario as the primary basis for the high climate future and by the B1 emissions scenario as the primary basis for the low climate future for the 2013 report. These emissions scenarios were generated by the Intergovernmental Panel on Climate Change (IPCC) and are described in the IPCC Special Report on Emissions Scenarios (SRES) ([IPCC 2000](#_ENREF_31)). These scenarios were selected because they incorporate much of the range of potential future human impacts on the climate system and because there is a large body of literature that uses climate and other scenarios based on them to evaluate potential impacts and adaptation options.

The core source is the set of global climate model simulations performed for the IPCC Fourth Assessment Report, also referred to as the Climate Model Intercomparison Project phase 3 (CMIP3) suite. These have undergone extensive evaluation and analysis by many research groups. A second source is a set of statistically-downscaled data sets based on the CMIP3 simulations. A third source is a set of dynamically-downscaled simulations, driven by CMIP3 models.

***How should the climate scenarios information be used?***

The use of the climate scenario information should take into account the following considerations:

1. All of the maps of climate variables contain information related to statistical significance of changes and model agreement. This information is crucial to appropriate application of the information. Three types of conditions are illustrated in these maps:
   1. One condition is where most or all of the models simulate statistically significant changes and agree on the direction (whether increasing or decreasing) of the change. If this condition is present, then analyses of future impacts and vulnerabilities can more confidently incorporate this direction of change. It should be noted that the models may still produce a significant range of magnitude associated with the change, so the manner of incorporating these results into decision models will still depend to a large degree on the risk tolerance of the impacted system.
   2. The second condition is where the most or all of the models simulate changes that are too small to be statistically significant. If this condition is present, then assessment of impacts should be conducted on the basis that the future conditions could represent a small change from present or could be similar to current conditions and that the normal year-to-year fluctuations in climate dominate over any underlying long-term changes.
   3. The third conditions is where most or all of the models simulate statistically significant changes but do not agree on the direction of the change, i.e. a sizeable fraction of the models simulate increases while another sizeable fraction simulate decreases. If this condition is present, there is little basis for a definitive assessment of impacts, and, separate assessments of potential impacts under an increasing scenario and under a decreasing scenario would be most prudent.
2. The range of conditions produced in climate model simulations is quite large. Several figures and tables provide quantification for this range. Impacts assessments should consider not only the mean changes, but also the range of these changes.
3. Several graphics compare historical observed mean temperature and total precipitation with model simulations for the same historical period. These should be examined since they provide one basis for assessing confidence in the model simulated future changes in climate.
4. Temperature Changes: Magnitude. In most regions, the model simulations of the past century simulate the magnitude of change in temperature from observations the southeast region being an exception where the lack of century-scale observed warming is not simulated in any model.
5. Temperature Changes: Rate. The *rate* of warming over the last 40 years is well simulated in all regions.
6. Precipitation Changes: Magnitude. Model simulations of precipitation generally simulate the overall observed trend but the observed decade-to-decade variations are greater than the model observations.

In general, for impacts assessments, this information suggests that the model simulations of temperature conditions for these scenarios are likely reliable, but users of precipitation simulations may want to consider the likelihood of decadal-scale variations larger than simulated by the models.