I. Background Information

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The comments of the AASC were adopted unanimously for submission to the Strategic Plan for the Climate Change Science Program.

II. General Comments on the Strategic Plan:

The American Association of State Climatologists (AASC) is a professional scientific and service organization composed of state climatologists (one per state), representatives of the six Regional Climate Centers, and associate members who are persons interested in the goals and activities of the Association. State Climatologists are individuals who have been identified by a state entity as the state's climatologists and who are also recognized by the Director of the National Climate Data Center of the National Oceanic and Atmospheric Administration as the state climatologist of a particular state.

These comments provide the perspective of the AASC on the Strategic Plan for the Climate Change Science Program. Since the AASC members work directly with users of climate information at the local, state, and regional levels, the AASC is uniquely able to place climate issues into the local perspective needed by the users of climate information. These comments were voted on and approved by the AASC.

Our perspective, based in part on the 2001 AASC Policy Statement on Climate Variability and Change (http://lwf.ncdc.noaa.gov/oa/climate/aasc.html), are summarized as follows:

- Climate prediction is difficult because it involves complex, nonlinear interactions among all components of the earth's environmental system. These components include the oceans, land, lakes, and continental ice sheets, and involve physical, biological, and chemical processes. The complicated feedbacks and forcings within the climate system are the reasons for the difficulty in accurately predicting the future climate.

- Climate prediction is complex with many uncertainties, and the AASC recognizes climate prediction is an extremely difficult undertaking. For time

scales of a decade or more, understanding the empirical accuracy of such predictions – called "verification" – is simply impossible, since we have to wait a decade or longer to assess the accuracy of the forecasts.

- Human activities have an influence on the climate system. Such activities, however, are not limited to greenhouse gas forcing and include changing land cover and aerosol emissions, which further complicated the issue of climate prediction. Furthermore, climate predictions associated with human disturbance of the climate system have not demonstrated skill in projecting future variability and changes in such important climate conditions as growing season, drought, flood-producing rainfall, heat waves, tropical cyclones and winter storms. These types of events have a more significant impact on the United States than annual global temperature trends.

- General circulation models which have been applied to project changes in global and regional climate for periods of decades into the future need to be viewed as hypotheses about the behavior of the atmosphere in response to human disturbance. The validity of such models is uncertain because our understanding of all relevant climate factors (and their relationships and interactions) is incomplete. New research should be based only upon hypotheses that can be verified by observed data. This underscores the need to continue (and, in fact, enhance) the long-term climate monitoring system in the United States so that, for example, climate models can be properly tested.

Our recommendations for the Strategic Plan are as follows:

- Research on long-term climate should not be based on specific projections, but instead focus on policy alternatives that make sense for the range of plausible regional and local climate variations.

- By focusing on society's vulnerabilities to climate change rather than on climate projections, the scientific community can provide more comprehensive and useful information to local, state, and national decision makers. A lack of an ability to generate accurate projections should not be used as a justification to ignore the policy challenges presented by climate variability and change. Research must be directed to better identify and quantify these vulnerabilities.

- The use of historical scenarios such as the 1930s Dust Bowl years, or more recently the 1988 and 2001 droughts and the 1993 flood, can improve climate scenario development. Not only are these physically plausible scenarios, they provide the opportunity to examine how society and the environment actually responded. Research should be completed to assess how society would respond today to these climate events.

- State and regional climatologists can provide analysis tools and climate data, some of it unique (e.g. soil moisture or mesonet observations) in the context of

the assessment of the vulnerability of local and regional areas to climate variability and change.

- More emphasis should be placed on two-way communications with stakeholders as part of the research process. By involving stakeholders with varied and competing interests early in the process, climate researchers can focus on the important climate parameters, and stakeholders will understand the limits of the information provided to them. Since the impacts of climate variability and change vary widely across regions within the United States, state and regional climatologists, and other local experts, who are most familiar with the stakeholders and the potential impacts at this scale should be involved in the research.

- Peer review judgment from a handful of experts should not be the final test following release of climate projection publications. Independent climate groups and organizations such as the AASC should be provided an opportunity to periodically evaluate the accomplishments of the US Climate Change Science Program.

- Financial resources should focus on the assessment of local and regional vulnerabilities and possible responses rather than the generation of projections of future climate from general circulation and regional numerical forecast models.

Finally, as an overarching goal, the AASC recommends we concentrate on reducing our vulnerability to paleo, historical and current weather extremes, for this would allow us to better protect ourselves from problems associated with the spectrum of future weather extremes.

III. Overview Comments on Chapter 3: Climate Quality Observations, Monitoring, and Data Management

The AASC has a strong interest and considerable expertise in the issues discussed in Chapter 3 including the US climate network (particularly the Cooperative Observer Network), data quality, climate monitoring, and making the climate record accessible to users. Some examples of this include active involvement with the Climate Database Modernization Project at NCDC, reconstructing climate extremes from historical accounts, developing and applying quality-control procedures to climate data, and working extensively at the state and regional level with users of climate information. Rather than building a new infrastructure to address the issues discussed in this chapter, it would be more effective to build on the existing network of climate expertise of the state and regional climate centers.

IV. Overview Comments on Chapter 6: Climate Change and Variability

The AASC has experience in addressing a number of issues related to climate change and variability, as outlined in Chapter 6. Our activities include evaluating and assisting decision-makers in using seasonal weather predictions, monitoring climate extremes including their impact on society and the environment, and providing climate information to a wide range of users. The mix of users and their needs vary from region to region (for example, New England has different requirements for climate information than the southwest US). As a result, the interaction with these users has to be at the state and regional level. It would be more effective to support the existing infrastructure of state and regional climate expertise rather than start from scratch. By using the existing local, state and regional expertise, several of the "products and payoffs" in Chapter 6 with a 5-15 year time horizon, particularly on page 78, could be accomplished much sooner.