

Conference Report

by Mark J. Spalding

“Tilting the Balance: Climate Variability and Water Resource Management in the Southwest” March 2-4, 1998 The University of Texas at El Paso.

This conference was billed as a discussion of how to respond to global climate change in the Southwest, and not as a debate on whether climate change exists. The stated purpose of the conference was to inform the region about potential climate changes to expect as a result of global warming, to ask what the local and regional impacts would be from those climate changes, and to review the related research needs and policy options suggested by those impacts. Unfortunately, while the meeting invitation assumes climate change exists, it calls for a discussion of how to deal with climate change in the context of continued growth in the border region. It was clear that any suggestion of limiting development or population pressures on the fragile desert environment was not on the table. The conference was sponsored by the National Aeronautics and Space Administration, the Pan American Center for Earth and Environmental Studies (PACES), the United States Geological Survey, the Environmental Protection Agency, and the United States Department of Agriculture. The meeting was organized to fulfill a US Congress mandated evaluation of climate change impacts (see the 1990 Act on Global Change). To back this up, six border district Congressional Representatives, both Republicans and Democrats, spoke during the opening of the conference on the importance of understanding the impacts of climate change on the border environment. The meeting in the Southwest was among the first phase of meetings which included the Northern Great Plains, Middle Atlantic, New England, Southeast, Pacific Northwest, Central Great Plains and Alaska. As this first phase is nearly complete, a second phase of meetings has been organized to include California, the Rocky Mountains/Great Basin, Northern Great Plains, Texas/Southern Great Plains, Gulf Coast, South Atlantic/Caribbean, Metro East Coast, Eastern Midwest, and the Upper Great Lakes.

Tilting the Balance was opened with a series of talks on the issues related to climate change and the current best predictions for how it might impact the Southwest. As a result of global warming, we can expect climate change which will include changes in ambient temperatures, changes in precipitation and rises in sea levels. Specifically, except for coastal California, the Southwest can expect decreased precipitation and higher temperatures (and a resultant increase in evapotranspiration). The bottom line for the region, are serious long-term drought conditions. These opening talks covered the Geological Perspective on Global Warming, Climate Trends and Projections, the Consequences of Climate Variability, Opportunities for Effective Resource Management, the Use of Technology, Water Planning and Management in a Time of Change, and even a video taped appearance by Vice President Al Gore. However, most of the meeting was devoted to working group sessions devoted to a set of topics: Agriculture, Water Resources, Understanding Change, Drought Preparedness and Management, Environmental Education, Regional and Urban Air Quality, and Human Health.

All of these work groups called for more region specific modeling which could tell which crops to avoid and adopt, what pests to be concerned with, and the potential for continued viability of range land and hydrology. They viewed current climate change models as too large in area of generalization and too great in time. The group called for better linkages between global climate change information and local weather change. This greater accuracy is needed for accurate water use and hydrology planning. Finally, all the groups noted that education is primary. Unless the public is informed and convinced, it will not drive policy change. The information to substantiate these threats must be made available in an accessible format. There is thus a need to educate the public and policy-makers regarding climate change and how to deal with the uncertainty of how climate change will affect weather patterns. For example, even though air basins are not coextensive with the regional watersheds, there is still an interconnection between water, climate change and air quality. The changes within these interconnections threaten human health. Unfortunately, the scope and need for environmental education is almost overwhelming. It needs to be undertaken at all levels and ways must be developed for integration of the topic into already overloaded curriculums.

Because climate change is predicted to decrease precipitation, and to increase temperatures which would increase evapotranspiration, it is reasonable to conclude that drought conditions will be the result. The current margin (the difference between precipitation and evapotranspiration) in the Southwest is small, estimated in water budgets at 4 to 6%. The Water Resources and Understanding Change work groups suggest the detailed study of past droughts because they recognize that planning for extreme droughts is probably a good proxy for planning for climate change. In addition, the groups suggested further workshops were needed as well as comprehensive studies of historic events of record (droughts and floods) including anecdotal stories of individuals' responses. As an aside, the chair of the Water Resources group reminded the conference that Texas gets 90% of its electricity from steam generation which also might be impacted by a serious drought.

While some of the traditional debates which always arise in the Southwest came up again (agricultural water use versus urban and environmental needs), the Agriculture work group focused on the fundamentals of water use which needed to be changed. They suggested dropping the "use it, or lose it" mentality and the related water sales procedures which encourage consumption rather than conservation. While the general threat from climate change was clear, there was a concern about the different forms it might take. The Drought Preparedness and Management group also suggested changing how water is dealt with, removing the consumption incentives and replace them with free market and tax incentives as has been done with energy conservation and pollution prevention. Any drought planning and management initiatives should be binational, and address legal water rights which differ from one jurisdiction to another. Finally, this group called upon federal, state and regional agencies to take responsibility for assisting local agencies in getting drought plans in place. The Agriculture group suggested that the government undertake to develop an experimental farm using conservation techniques, alternative technology and crops for

locals to examine, learn from and adopt. Included in this might be methods to reduce emissions of green house gases from cattle, fertilizers etc. and how to add carbon sinks such as tree lines.

The Understanding Change group began with three assumptions: Assume there is no certainty in the future because climate change models are not good enough for planning and will not be for some time; Assume we must learn to adapt to change; and Assume the border is invisible and that all science and policy cooperation is binational. This group called for more weather monitoring stations in the Southwest, the better development of integrated environmental information, and that an effort be made to compile existing data. In collecting data and information, the focus should be on human vulnerability. Taking a systems approach, ask what is the impact of climate change on humans. To make this more useable, and therefore more valuable, there needs to be greater collaboration between the environmental community and the information community. For example, this could include the development of software for the modeling of environmental uncertainty.

Because the Southwest is such a fragile ecosystem, it is bound to be altered from any change in the climate and this will affect human health. If the global climate becomes wetter there is a much higher likelihood for the spread of infectious disease. If the regional climate becomes warmer it may cause death in the very old and the very young, and if the region becomes dryer there may be more particulate matter in the air and thus problems related to respiration. In addition, if the heat reduces UV protection in the atmosphere, it can be expected we will see more skin cancer in the region. This worsening of health conditions would be added to poor health infrastructure in the region. Low incomes, and the lack of infrastructure directly affect access to adequate health care.

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