While many among us are working to reduce greenhouse gas emissions, the climate is already changing and will continue to change for a long while even if we do everything we can to reduce emissions. As a result, we will need to adapt to our new reality, by building the resilience to deal with changing conditions. I (along with co-blogger Dan Farber and many others) just returned from a two-day interdisciplinary conference on adaptation to climate change in the Southwestern U.S., convened by the University of Arizona's James E. Rogers College of Law. During the short time the conference was in progress, the two leading scientific journals, Science and Nature, each published an article providing more evidence that adaptation is necessary.

The participants in the Arizona conference provided a sobering look at one of the most significant consequences of climate change: places that are already characterized by extremes of temperature, precipitation, and other climate features will become even more extreme. The conference participants' presentations showed how climatic changes will test arid regions' ability to provide sufficient water to human populations, avoid serious impacts from catastrophic wildfires, and support species that are adapted to very specific climatic conditions. All this will jeopardize humans' ability to live safely in those conditions unless we take significant steps to adapt to the changes. (UCLA School of Law also put on a conference on adaptation to climate change in 2007, highlighting similar issues, but not geographically focused as the Arizona conference was.)

The two journal articles published this week underscore the need for adaptive planning and action. The paper published this week in Science (content by subscription or purchase only) found that trees in older conifer stands in Western U.S. forests are dying at a rate twice that of a few decades ago. (This article is described and discussed in more detail in this post by co-blogger Holly Doremus below.) The authors, respected forest scientists including Nathan Stephenson of the U.S. Geological Survey, believe that warmer temperatures, and related drought conditions and vulnerability to pests and other threats, are responsible. (This New York Times article discusses the Science paper's findings.) Meanwhile, the Nature article, published this week by researchers from UC Berkeley and Harvard, found that the seasons are beginning two days earlier on average.

These findings are significant in their implications, if not unexpected. Changes in the timing of seasonal events such as snowmelt and rainfall are likely to have significant impacts on systems of critical importance to humans. In California, as in many regions, our water supply depends on snowpack to store water until it is needed, releasing it as the snow melts in the spring and summer. Even if we were to build new dams at breakneck speed – an idea that would be disastrous for other reasons – we could not store enough water into the spring, summer, and fall each year to come close to making up the water storage capacity

we are predicted to lose over the coming decades as the beginning of spring creeps earlier into the year. And warmer and drier weather in the state will not just remake our forest ecosystems: it will continue to increase the wildfire threat to our communities and will jeopardize our agricultural output, especially fruits and nuts that rely on specialized weather conditions to thrive. In this context, continued work to develop legal and policy mechanisms to promote adaptive capacity – figuring out how to change our community needs, government policies, and business practices to survive with more heat, less water from the mountains, and different agricultural potential – will be essential to a secure future. Of course, the less the climate changes, the less we will have to adapt. But building the resilience we need will be essential, even under best-case scenarios.