

## Summary:

### Sources of Stress and the Changing Context of Natural Resources

#### Law and Policy in the New West

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While the American West holds no exclusive charter on natural resources law, it has acted as crucible for natural resource and conservation practice, and served as host to important debates over water, species, forests, range, and energy policy—to which previous versions of this very conference bear evidence. The West holds the lion's share of the nation's carbon energy supply, and because it remains the least developed of American regions and the most dominated by public lands, it also provides the setting where the nation has established the largest national parks (in the conterminous U.S.) and where species protection and restoration plays out most prominently.

To my mind the future of the West and the future of natural resources policy, are closely bound together, and, I believe that future is one in which large, enduring forces, of both nature and society, are on a collision course.

#### Socio-Demographic Trends

The demographic momentum of the West is remarkable: the region is growing faster than the nation as a whole, and has done so for much of its history (Figure 1). And this growth is remarkably balanced across all the forces that can grow a regional population: the West is the preferred landing spot for international immigrants to the U.S. (documented and undocumented), it is the preferred target of domestic immigrants, especially from the Midwest and Northeast, and it is the most fertile and youngest part of the U.S. (Figure 2), factors which ensure future growth. Additionally, this momentum is now less tied to traditional economics in the sense that the West attracts people not just because it grows jobs, but because more people now locate due to quality of life, landscape, recreation, etc. And just to put the icing on the West's demographic cake, the nation is on the verge of the largest retirement surge in its history, and the West enjoys a positive perception among retirees.

#### Land Use Trends

Perhaps the bigger story about population growth in the American West is that the land use 'footprint' of that population is enlarging *per capita* in the region. Here are some ways that works:

- More/Larger houses *per capita* (*more families per capita as of the 2000 census!*)
- Longer commutes ("extreme commuting")
- Enlarged commercial and infrastructure land uses *per capita*
- Inefficient regional land use (duplication)
- Further reach for resources like water & recreation into wildlands and onto public lands.

So, for example, during 1980-2000 *Colorado's population grew 49%, while urban/suburban land use grew 65%*. Additionally, it is my assessment that the changing geographic location of development in the West is such that it further complicates resources management and environmental protection. In particular, not only does the region host the fastest growing cities in the nation's absolutely driest environments, but expanding exurbs mean a growing impact on the edge of wildlands—leading to conflicts between development and species, wildfire, and other natural processes.

#### Resource Demand / Pressure on Land and Habitat

Partly because of the region's growing population and expanding economy, many of the West's resources are also under increasing pressure (though this, of course, is also fueled by national and international socio-economic trends, like the price of oil and the growth of international tourism). For example, simultaneously with another major energy rush, the West is also dramatically growing its recreational facilities: all the major, and many minor, ski resorts in the region are adding new facilities, expanding base villages and adding to

on-mountain facilities. Many are expanding their ski terrain, and one totally new major resort has opened in Idaho (Tamarack).

Despite efforts to protect roadless areas, the West's most natural landscapes are being whittled away, on public and private land, by the above forces, especially suburban and exurban sprawl on the latter, and energy development and the expansion of recreation on the former. A few counter-trends obtain. There's some evidence that we're in a transition in ranching in the West, where the grazing demand on public lands is waning and, in my view, likely to decline faster in the future. This does not necessarily mean an end to the federal range conflicts, which are driven as much by fees and some species regulations (especially for predators) as they are by environmental limits on grazing pressure, but new types of ranch owners, emerging conservation practices, and market pressures are yielding a different rangeland regime.

## Resource Quality

I am not an ecologist, but it does not take a biology degree to recognize that, despite some improvements (e.g., in water and air quality), most ecological assessments find mostly negative trends. Both the national (*State of the Nation's Ecosystems*, from the Heinz Center) and global (*Millennium Ecosystems Assessment*, from the UN) recent ecological assessments find mostly negative ecosystem trends, and I see no reason to dispute these trends in the West (though no western regional assessment has been made, to my knowledge). There is also little of a sanguine nature in projections of global warming impacts, nationally and in the American West (as indicated in Jerry Meehl and Chris Field's presentations/papers at the 2006 NRLC conference).

The science foundation for the threat of global warming is well established, and its regional manifestations are coming into better focus as actual trends and climate model output add to our understanding. The West will experience significant warming over the next century, and though Western precipitation projections vary, the warming effect on evapotranspiration and snowmelt assures the region an altered runoff regime; probably less total, but certainly earlier and more concentrated runoff in many key watersheds, trends that inevitably complicate water resources management. Even if precipitation does not decline in average, new information coming from the models and paleo-climatological studies indicate that the West will experience more frequent and more intense drought episodes over the next century. A real challenge in all climate-related trends is that shifts in mean conditions can be accompanied by significant changes in frequency and magnitude of extreme events.

Furthermore, a significant amount of warming through the middle of this century is already committed in the earth's climate system, even if the global community acts assiduously to reduce GHG emissions (and any delay simply worsens and prolongs the ultimate warming). The IPCC Fourth Assessment Report (IPCC AR4) Working Group 3 summary issued in Bangkok in May, suggests that with great effort we might be able to keep global warming to an additional 2 degrees C this century. I doubt it, and the West may warm more than 2 degrees even if the global average can be held to that threshold.

## An Ill-fated Future?

Dismal scenarios are easy to develop: Global warming and forest dynamics will conspire to create a couple of decades of much more widespread fires in the West (as occurred in the past record), but this recycling of the region's forests will occur when they are more involuted with development than ever before---this will be costly and painful episode, that will certainly force some policy changes.

While there is plenty of water in the West for urban growth, assuming it can and will move from agriculture, the resource is likely to become more unreliable such that urban supply systems will find themselves forced to do two unpleasant things: obtain larger supply compared to use in order to firm up reliability, and to declare more frequent shortages, and, eventually, permanent water rationing.

Land development and climate change, together, will stress habitat and species, such that conservation investments will become more risky, that is, the probability that any conservation plan will meet its objectives will decline. The general ecological notion is that systems undergoing stress tend to degrade, even as they attempt to adjust to new conditions. So the conservation problem is not just one of planning for change (e.g., protecting migration corridors, refugia, etc.), but of recognizing that some systems will degrade no matter what conservation plans are in place.

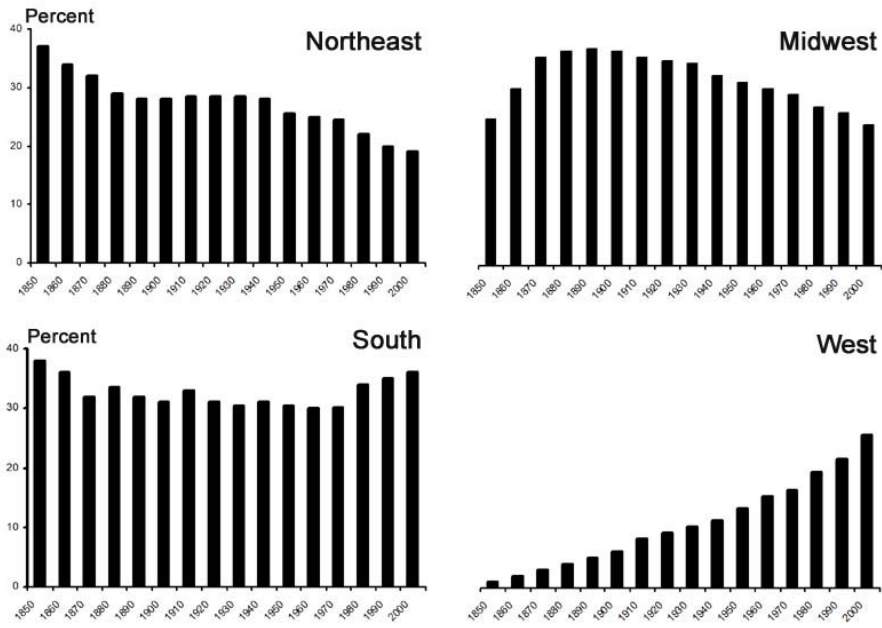


Figure 1: Proportion of total U.S. population in four quadrants, 1850-2000. Modified and up-dated from George Masnick, 2001: "America's shifting population: Understanding migration patterns across the West." *The Rocky Mountain West's Changing Landscape* 2(2) Winter/Spring: 8-14.