

Weathering Climate Change

Another Reason to Keep a Watchful Eye on Mono Lake

by Arya Degenhardt

Evidence for climate change is mounting, with new reports from experts making newspaper headlines almost weekly. While the actual changes and their subsequent effects around the world are still hard to predict, climate change is becoming accepted as part of the reality of life on earth for humans, habitats, and ecosystems. What will climate change mean for Mono Lake? It's hard to say, but we're starting to see the effects of climate change in the Sierra Nevada, which directly affect the Mono Basin, and specifically, Mono Lake.

The Sierra Nevada Alliance, a coalition of Sierra Nevada environmental groups, recently released the report *Troubled Waters of the Sierra*. The report draws on existing research and evaluates the effects of climate change in the Sierra over the next 25–90 years and how these effects will significantly impact the water delivery systems of California and Nevada.

Sitting here at the base of the Sierra—where the snowline, snow pack, and spring runoff are not only part of daily life, but part of a larger structure of aqueducts, reservoirs, water consumption, stream restoration, and Mono Lake's level—the changes now and in the near future are very real.

Climate Change Facts

Broadly speaking, climate change is expected to affect both the type and timing of precipitation in California, but not the total amount. The majority of climatologists predict a rise in average California temperature that will shrink the Sierra snow pack by up to 48% by 2090. These scientists agree we will see a rise in the snow line by 500 feet in the next 25–30 years, reducing the total snowpack and leading to earlier runoff. Since 65% of California's developed



Aerial view of the Mono Basin taken in the early 80s when the land bridge connected Negit Island to the mainland.

water supply comes from the Sierra and its snow pack, this will mean significant change.

And changes are already occurring. University researchers report that over the past 50 years snowmelt runoff in Northern California has been occurring earlier in the year, and winter and springtime floods have increased due to rain-on-snow events. The Southern Sierra has experienced a 10% reduction in runoff during the spring and summer in the last 100 years. This trend is accelerating.

Data indicates that human affects are accelerating the natural warming that was already occurring after the end of the Little Ice Age in the mid 19th century. Researchers have documented that many glaciers around the world are shrinking. A recent survey of Sierra glaciers, including the Dana Glacier in Mono's watershed, are shrinking as well.

What Does This Mean For Mono?

If the snow line is rising and total precipitation is relatively constant, that means more water arriving in the form of rain and less in the form of snow. That, in turn, means a smaller spring runoff from snowmelt and a greater chance of flooding

due to large rain events. And that means a change for the Mono Basin ecosystem as well as for the Los Angeles Department of Water and Power (DWP) aqueduct system.

The good news for Mono Lake is that the snow pack affecting the lake is less vulnerable to higher snowlines than other areas of the Sierra since much of Mono's snow runoff is from high elevations. Because snow pack reduction will be less at high elevations and more marked at lower elevations, the direct effects on Mono Lake may be tempered.

And the bad news? At this point, it's hard to say, so we asked hydrologist Peter Vorster for his perspective. On the subject of how climate change will affect Mono Lake he said, "All of the Water Board projections of future lake levels and DWP exports were made with models that assumed a stable climate—we know that will not be the case, and have already seen higher temperatures in recent summers. Warming could increase evaporation at Mono Lake and that would mean more runoff is needed to maintain the Water Board ordered lake level. This means that unless the total runoff increases, DWP would get less runoff to export."

What Does This Mean for DWP?

Due to the gradual onset of climate change, some people have been skeptical that it is even a real trend at all. However, with an increased amount of supporting data, people are starting to react. In 2000, ski areas across the country adopted the Sustainable Slopes Environmental Charter, which identifies climate change as a potential threat to the ski industry. In 2003 even the Bush Administration acknowledged climate

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Governor Schwarzenegger Proposes a Sierra Nevada Conservancy

by Frances Spivy-Weber

The Mono Lake Committee has joined with many other organizations in the Sierra, Los Angeles, and the Bay Area to work with California's new governor and the legislature to design a Sierra Nevada Conservancy. The Committee's success in working cooperatively with urban communities to protect Mono Lake is the model we bring to this effort to gather broad support for legislation.

Like the Coastal Conservancy or the Lake Tahoe Conservancy, if a Sierra Conservancy is established by the legislature, it will be able to receive funding for designated purposes, with a defined governance structure and powers. As this newsletter goes to press, the governor's proposal has not been

fleshed out, but there are many years of thinking about this idea upon which he and the legislature can build.

The Mono Lake Committee thinks a Sierra Nevada Conservancy should serve many purposes. Among the most important ones are protection and enhancement of natural diversity and natural resources, open space, working landscapes, riparian areas, water quality and water supply both in the Sierra and in the urban areas that use Sierra water, watersheds, wildlife habitat, recreational opportunities, interpretive facilities, sustainability of the local communities, public access, and the unique cultural, artistic, economic and historic resources within the Sierra that makes the region

so vital to the future of California.

The Committee expects a Sierra Conservancy will be able to lease, sell, exchange, and rent property acquired from willing sellers. And importantly, a Conservancy must consult with and coordinate its activities with public agencies, local land trusts, and other entities dedicated to land conservation or involved with the management of public lands.

By the time you receive this newsletter, we expect there will be a bill or possibly several bills introduced to create a Sierra Nevada Conservancy. Please check the Committee's website www.monolake.org for details. ❖

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change by announcing federal initiatives designed to organize the federal government's climate change science research system and to fund global climate observation. As recently as December 2003 the council of the American Geophysical Union, one of the nation's top scientific organizations, issued a new warning that human activities—most notably the greenhouse gas emissions from power plants and other industries—are warming Earth's climate at a faster rate than ever.

With evidence mounting, we spoke with Mark Hanna of the Los Angeles Department of Water and Power to hear DWP's perspective on climate change. On the subject of what DWP is doing to anticipate current and future changes Mark said, "DWP follows the studies being released and diligently tracks the data, but spotting trends is difficult with long slow change. The Department will address changes as they arrive. There are discussions of more rain, less snow, but it really is unknown. The Department's concerns are with supply as well as demand. So for now, before concrete patterns emerge, the Department will continue to emphasize water

conservation as the best way to prepare for change in the future, whether that change comes from climate, population growth, or any other variable."

As part of its supply and demand monitoring DWP currently collects very useful real time data on water flows and reservoir capacities in the Mono Basin, with data posted online at <http://web.ladwp.com/~wsoweb/Aqueduct/realtime/monorealtime>. According to Peter Vorster, "Real time flow monitoring will need to be followed by increased real time flow management in order to provide DWP all the exportable water they had hoped for as well as provide the expected benefits of stream restoration flows."

The Next Step: Responding to Change

The Sierra Nevada Alliance's report brings together data from the many watersheds of the Sierra, and in doing so paints a picture of where California and Nevada are headed in the coming years in terms of water supply, infrastructure, the demands of population growth, and the potential for shifts in natural cycles as we know them.

The effects of the warming trend will

be different throughout the Sierra, but two messages come through loud and clear: water conservation in both rural and urban areas will be increasingly essential, and evaluation of water infrastructure for efficiency is absolutely necessary.

The scope of the climate change challenge is now coming into focus; formulating specific responses at Mono Lake, in the Sierra, and for California will challenge our thinking and creativity. Already, the Committee's work on water conservation and infrastructure efficiency is part of the multifaceted set of responses needed. But climate change will demand much more from all of us, and the Mono Lake Committee will be asking the climate change questions that matter for Mono Lake—and hopefully finding creative answers as well.

For the Sierra Nevada Alliance's full *Troubled Waters of the Sierra* report see www.sierranevadaalliance.org. ❖

Arya Degenhardt is the Committee's Communications Director. She humors the town every time she walks (or more accurately gets walked by) her dogs to the creek trail.