

Golden Gate Climate Update Transcript

Interview with Dr. James Johnstone
Post-doctoral Researcher, University of Washington
Interviewed on July 10, 2010
Will Elder interviewer
Part 2

Music begins and fades slightly

Will - Hi, I'm Ranger Will Elder, and welcome to Golden Gate Climate Update, your source for information on climate change and sustainability. This episode is a continuation of our interview with Dr. James Johnstone, post-doctoral researcher at the University of Washington's Joint Institute for the Study of Atmosphere and Ocean. But before we get back to the interview, here is the answer to our climate update challenge. According to the Save the Redwoods League, 95 percent of all redwood forests have been logging in the past 160 years, leaving less than 106 thousand of the original 2 million acres.

Now back to Jim. So now let's move onshore. What is the relationship between fog and the redwood forest in California, and what changes might we expect to see in the redwoods relative to a decrease in fog, if that is what we are really seeing?

Jim – The forests are located within a fairly narrow belt that runs along the coastline for about the first 50 kilometers or so. And so, you know, fog and redwoods have long been associated with each other, as the redwoods only live in that foggy zone of northern California and extreme southern Oregon. And when we look at the behavior of redwood trees under foggy and fog free conditions, what is most clearly apparent is that the trees lose water at a pretty high rate when the skies are fog free, or when the atmosphere is very dry. So the fog itself provides the trees with a mechanism to conserve water, it prevents damage to the trees by reducing the frequency of extremely hot, dry days which are quite common to the interior of California, but the fog at the coastline reduces the frequency and intensity of those sorts of events.

Will – So could redwoods farther from the coast face a greater threat than those closer to the ocean?

Jim – It's pretty clear from the geographical evidence, and from the physiological data, that the trees are reliant on the cool, humid, marine conditions in summer and that fog is a big part of that. So, if the long-term trend towards less fog continues into the future, you might expect that redwood trees in the more marginal, inland parts of the range will probably

be more drought-stressed, they'll have less of that protective cool humid air in summertime, and that trees might have a difficult time in reestablishing in those areas, and that we might see damage to trees in those sort of marginally dry areas.

Will – And likewise, would you maybe see an expansion to the north?

Jim – That's a possibility. I mean there are certainly many people looking at how tree distributions might change under a changing climate. One thing is that the fog tends to decline as you go north as well as south. So, the most likely place for them to move I think would be to the north, but it's not obvious that the foggy summers would necessarily be conducive to supporting them. And there are also competitive factors involved. So any redwood migration to the north would involve the displacement of other tree species that are already there, and the competitive balance between redwoods and other species would certainly be a factor in how far they are able to shift.

Will – I assume that probably any changes are going to be pretty long-term. Those are big old trees?

Jim – There is a bit of a paradox, the redwoods are in some ways very sensitive to the climate, I mean that is indicated by their geographic range that is just limited to the coastal belt there. But on the other hand, some of these trees live for a thousand years and longer, so they are able to tolerate natural climate changes that have occurred in the past. And then if we look at the paleoclimate record, going back thousands of years, it shows that during glacial periods, the redwood populations get knocked back to maybe five or ten percent of what they are now. So those sorts of climate shifts have major effects on the redwood populations, although we see over the last couple thousand years they seem fairly stable, so we're kind of getting into new territory here, we've already lost a lot of the old growth, the habitat is more fragmented now, so it is not a perfectly comparable situation to what has happened before.

Will – Okay, I guess we'll wrap this up by asking, is there anything the public can do to help preserve redwoods forests as they become more stressed and threatened?

Jim – They could certainly support conservation efforts. Groups like the Save the Redwoods League. The Save the Redwoods League has been buying up redwood habitat for a century now and putting it aside for conservation, and other groups as well do that sort of thing. It would probably be the best way to insure that the redwood forests are preserved for the future.

Will – Okay, well great. They have certainly been through a lot in the past and hopefully they will hang in there for a longtime in the future. Thank you for talking to us today.

Jim – Okay, you are welcome.

Will –Please join our next podcast, when we will be interviewing Sonya Capek, Solid Waste Management Coordinator for the National Park Service, Pacific West Region. Until our next podcast, this is Will Elder. Thanks for listening.

Music fades in and then out

Male voice - Golden Gate Climate Update is produced by Will Elder and is a product of the Earth to Sky Program, an innovative partnership between the National Park Service, the U.S. Fish and Wildlife Service, and NASA.

Music from *A Walk in the Desert* by Electronic Symphonic.