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## Atmospheric inversions, climate change, and resiliency of solar generation

Low level atmospheric temperature inversions act as lids that trap pollution in the boundary layer and are a necessary ingredient in the development and maintenance of coastal low clouds which cool and shade the landscape. Vertical mixing of the cool moist marine air is limited by this capping inversion, and formation of stratus cloud occurs when the upper parts of the capped layer reach saturation.

This temperature inversion is set-up, in part, by the interaction between the relatively cool California coastal sea surface temperate and the North Pacific High, which results in warm and dry descending air. The descending branch of the large scale Hadley circulation creates this semi-permanent high pressure system, which is strongest in Northern hemisphere summer.

The disposition of these stable atmospheric structures over California is an aspect of climate
projections that has not be well studied in the light of the newest suite of global and downscaled climate models. Due to the critical impact of inversions on extensive light-blocking coastal low clouds, it is key that any studies on the resiliency of solar resources to climate change also investigate variability, trends, and projections of inversion characteristics.

Iacobellis, S. F., D. R. Cayan J. R. Norris, and M. Kanamitsu, (2010). Impact of Climate Change on the Frequency and Intensity of Low- Level Temperature Inversions in California. Final Report to the California Air Resources Board Project 06-319 Available online at: http://www.arb.ca.gov/research/apr/past/06-319.pdf

Schwartz, R. E. (2015), California coastal low clouds: Variability and influences across climate to weather and continental to local scales, Doctoral dissertation, Univ. of Calif., San Diego, Calif. [Available at http://pqdtopen.proquest.com/pubnum/3725221.html and http://roger.ucsd.edu/record=b9055707~S9]