

# Measuring isotope variability in water vapor over Southern California

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Variations in the ratios of different isotopes of hydrogen and oxygen in water have long been used to trace water cycle processes, and the isotopic composition of water vapor in the atmosphere is known to change with weather events.

Farlin et al. measured the [isotopic composition](#) of [atmospheric water vapor](#) in San Diego, California, at hourly intervals during February 2011 using a ground-based sensor. The time period included severe rainstorms and Santa Ana winds.

They also used a general [circulation model](#) that included simulation of isotope variability to investigate how atmospheric and hydrologic processes affect isotope composition of water vapor near the surface.

They find that convective mixing of moist marine air and dry continental air causes most of the moisture and isotope content variation in their location, and that Santa Ana winds are great examples of these mixing events.

The authors use isotope and mixing ratios to infer the origin of moisture that contributes to the atmospheric moisture content in southern California and show that transport of vapor from the tropical Pacific is a major source of this moisture.

**More information:** "Influence of synoptic weather events on the isotopic composition of atmospheric moisture in a coastal city of the

western United States" *Water Resources Research*, doi:  
[10.1002/wrcr.20305](https://doi.org/10.1002/wrcr.20305), 2013.

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