# Air pollution tied to exports: Study finds blowback causes extra day per year of ozone smog in LA 

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Smog above Los Angeles, as seen from the Hollywood Hills. Credit: David Iliff

Chinese air pollution blowing across the Pacific Ocean is often caused by the manufacturing of goods for export to the U.S. and Europe, according to findings by UC Irvine and other researchers published today in the Proceedings of the National Academy of Sciences.

The study is the first to quantify how much pollution reaching the American West Coast is from the production in China of cellphones, televisions and other consumer items imported here and elsewhere.
"We've outsourced our manufacturing and much of our pollution, but some of it is blowing back across the Pacific to haunt us," said UC Irvine Earth system scientist Steve Davis, a co-author. "Given the complaints about how Chinese pollution is corrupting other countries' air, this paper
shows that there may be plenty of blame to go around."

Los Angeles, for instance, experiences at least one extra day a year of smog that exceeds federal ozone limits because of nitrogen oxides and carbon monoxide emitted by Chinese factories making goods for export, the analysis found. On other days, as much as a quarter of the sulfate pollution on the U.S. West Coast is tied to Chinese exports. All the contaminants tracked in the study are key ingredients in unhealthy smog and soot.

China is not responsible for the lion's share of pollution in the U.S. Cars, trucks and refineries pump out far more. But powerful global winds known as "westerlies" can push airborne chemicals across the ocean in days, particularly during the spring, causing dangerous spikes in contaminants. Dust, ozone and carbon can accumulate in valleys and basins in California and other Western states.

Black carbon is a particular problem: Rain doesn't easily wash it out of the atmosphere, so it persists across long distances. Like other air pollutants, it's been linked to a litany of health problems, from increased asthma to cancer, emphysema, and heart and lung disease.

The study authors suggest the findings could be used to more effectively negotiate clean-air treaties. China's huge ramp-up of industrial activity in recent years, combined with poor pollution controls, has unleashed often fierce international debates.
"When you buy a product at Wal-Mart," noted Davis, an assistant professor, "it has to be manufactured somewhere. The product doesn't contain the pollution, but creating it caused the pollution."

He and his fellow researchers conclude: "International cooperation to reduce transboundary transport of air pollution must confront the
question of who is responsible for emissions in one country during production of goods to support consumption in another."

More information: "China's international trade and air pollution in the United States" by Jintai Lin et al. PNAS, www.pnas.org/cgi/doi/10.1073/pnas. 1312860111

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