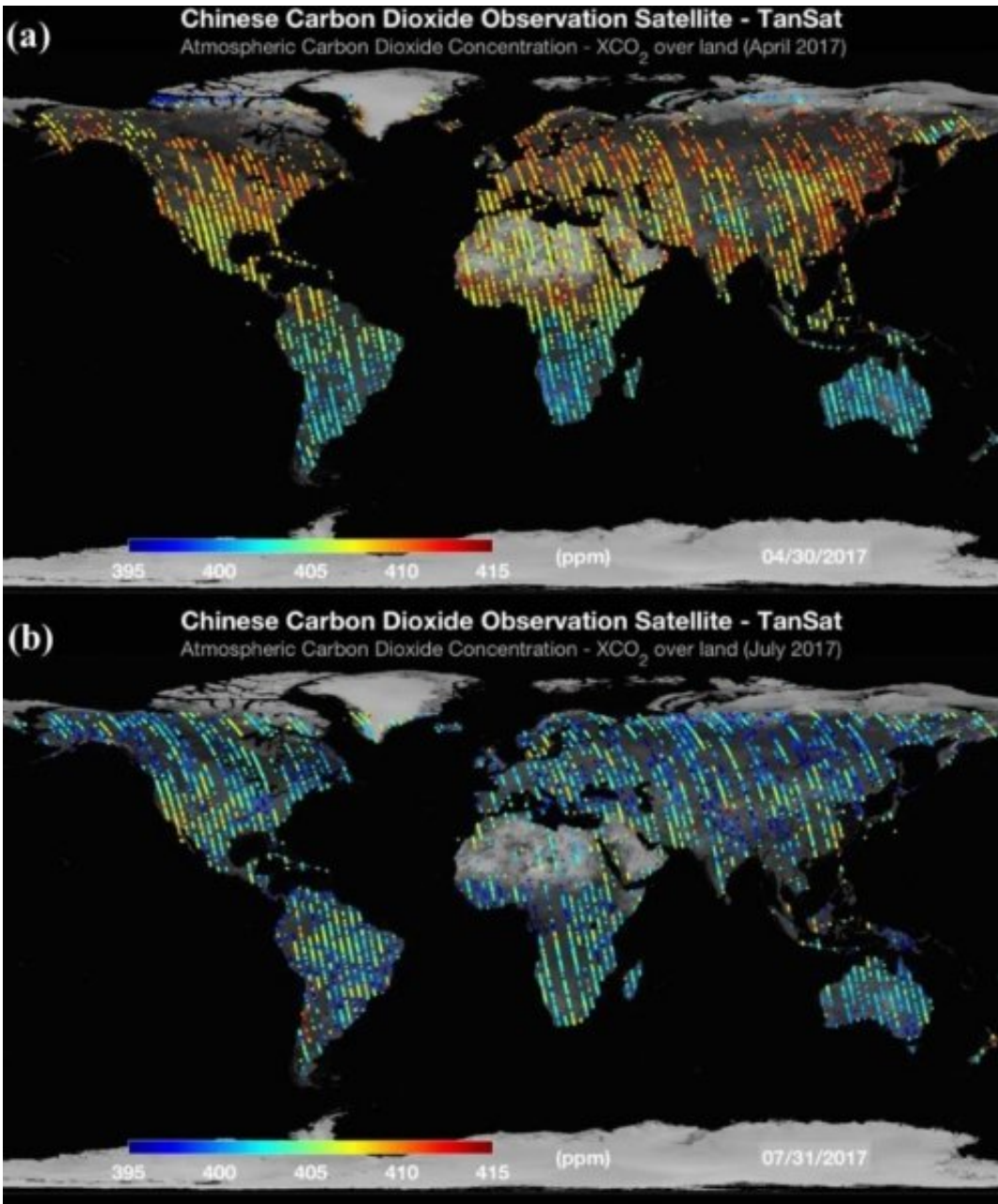


First global carbon dioxide maps produced by Chinese observation satellite

April 17 2018



Global XCO₂ maps produced from TanSat in nadir mode in (a) April and (b) July 2017. The colored marks indicate the XCO₂ values and the color scale bar is shown at the bottom of each figure. Credit: TanSat

An Earth observation satellite called TanSat has produced its first global carbon dioxide maps. TanSat was launched by a collaborative team of researchers in China, and these maps are the first steps to provide global carbon dioxide measurements for future climate change research. The maps, based on data collected in April and July 2017, are published in the latest edition of the journal *Advances in Atmospheric Sciences*.

"Global warming is a major problem, and [carbon dioxide](#) is the main greenhouse gas involved in heating the troposphere," wrote YANG Dongxu, first author on the paper and one of the team leaders.

"However, the poor availability of global carbon dioxide measurements makes it difficult to estimate [carbon dioxide emissions](#) accurately."

TanSat, launched in December 2016, is the third satellite in orbit capable of monitoring carbon dioxide with hyperspectral imaging, and it is China's first greenhouse gas monitoring satellite. The satellite measures not only the presence of carbon dioxide, but also what YANG calls carbon dioxide flux—the source and sink of carbon dioxide on Earth's surface. The satellite can measure carbon dioxide's absorption in the near-infrared zone for a better picture of carbon dioxide's behavior on and around Earth.

The TanSat maps were completed within a year of the satellite's launch.

"TanSat can provide global carbon dioxide measurements, which will reduce the uncertainty of flux estimation and support studies on climate change," YANG said.

TanSat's data was validated by YANG and his team through carbon dioxide measurements that took on Earth's surface and a comprehensive algorithm.

"Based on the maps, a seasonal decrease in [carbon dioxide concentration](#) from spring to summer in the Northern Hemisphere is obvious, and results from a change in the rate of photosynthesis," YANG wrote.

"Emission hotspots due to anthropogenic activity, such as industrial activity and fossil fuel combustion, are clearly evident in eastern China, the eastern United States, and Europe."

YANG and the rest of the TanSat team will continue to gather and analyze the global [carbon](#) dioxide data in an effort to better understand the concentration and impact of the [greenhouse gas](#).

"The first global CO₂ map of April and July in 2017 is a milestone of TanSat achievement, with the further improvement of data retrieval, it will provide more and better CO₂ measurements in future," Yang said.

More information: Dongxu Yang et al, First Global Carbon Dioxide Maps Produced from TanSat Measurements, *Advances in Atmospheric Sciences* (2018). [DOI: 10.1007/s00376-018-7312-6](https://doi.org/10.1007/s00376-018-7312-6)

Provided by Chinese Academy of Sciences

Citation: First global carbon dioxide maps produced by Chinese observation satellite (2018, April 17) retrieved 25 April 2024 from <https://phys.org/news/2018-04-global-carbon-dioxide-chinese-satellite.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.