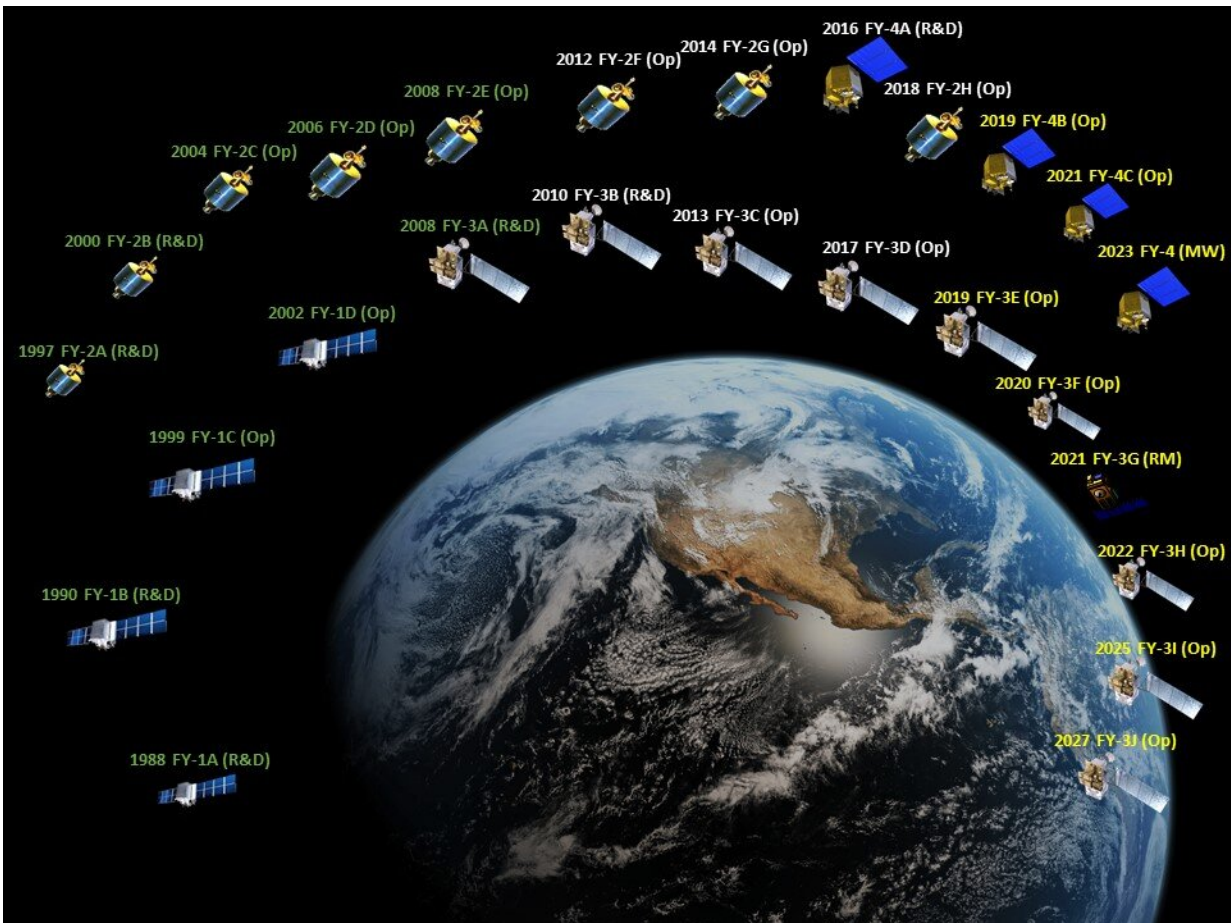


# New developments with Chinese satellites over the past decade

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Seventeen Chinese self-developed FengYun (FY) meteorological satellites have been launched, which are widely applied in weather analysis, numerical weather forecasting and climate prediction, as well as environment and disaster monitoring. Currently, 7 satellites are in operation. Credit: National Satellite Meteorological Center of the China Meteorological Administration

To date, 17 Chinese self-developed FengYun (FY) meteorological satellites have been launched, which are widely applied in weather analysis, numerical weather forecasting and climate prediction, as well as environment and disaster monitoring. Currently, seven satellites are in operation.

"The FY series [satellite](#) program has gone through four main stages," according to Dr. Peng Zheng, Deputy Director at the National Satellite Meteorological Center of the China Meteorological Administration, and the first author of a recently published review. (Note: When the article was submitted for review in late 2018, eight FY satellites were in operation. One of them retired in March 2019.)

"The first stage primarily focused on research and development (R&D) of satellite technology. FY-1A operated for 39 days and FY-1B for 158 days. Meanwhile, FY-2A operated for about six months and FY-2B for about eight months.

In the second stage, the R&D satellites were transformed to operational ones. Since FY-1C in 1999 and FY-2C in 2004, FY satellites have been stable in orbit and capable of supporting continuous measurements in an operational manner.

In the third stage, the first-generation satellites were transformed to second-generation satellites. During the past decade, the new-generation FY polar and GEO satellites, FY-3A in 2008 and FY-4A in 2016, have been in operation. Advanced instruments capable of multiple types of measurements have been mounted on the platform of the new-generation FY satellites, including multiband optical imaging, atmospheric sounding, microwave imaging, hyperspectral trace gas detection, and full-band radiation budget measurement. The new epoch for comprehensive earth observations has begun.

The latest and current stage is focused on the accuracy and precision of satellite measurements. High performance in image navigation and radiometric calibration is essential to support various quantitative data applications, such as quantitative remote sensing and satellite data assimilation."

Dr. Zhang and his team—a group of researchers from the National Satellite Meteorological Center of China Meteorological Administration—have had their summary of Chinese meteorological satellites published in a special issue of *Advances in Atmospheric Sciences* on the National Report (2011-2018) to the International Union on Geophysics and Geodesy (IUGG) Centennial by the China National Committee for IAMAS.

In this review paper, they report the latest progress, major achievements and future plans of Chinese meteorological satellites; particularly, the improvements in core data processing techniques including image navigation, radiometric calibration and validation, are addressed.

China has become one of few countries that maintain polar and geostationary [meteorological satellites](#) operationally. With the associated open data policy and stable and accurate measurements, the FY satellites are becoming an important component of the space-based global observing system. FY satellite data delivery services support direct broadcasting users, CMACAST users, and web portal users. Web portal users can obtain the data through an FTP push service, FTP pull service, or manual service. Users can access the data online after a quick and free-of-charge registration process.

**More information:** Peng Zhang et al, Latest Progress of the Chinese Meteorological Satellite Program and Core Data Processing Technologies, *Advances in Atmospheric Sciences* (2019). [DOI: 10.1007/s00376-019-8215-x](https://doi.org/10.1007/s00376-019-8215-x)

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