**Aqua** (**EOS PM-1**) is a [NASA](https://en.wikipedia.org/wiki/NASA) scientific research [satellite](https://en.wikipedia.org/wiki/Satellite) in [orbit](https://en.wikipedia.org/wiki/Orbit) around the [Earth](https://en.wikipedia.org/wiki/Earth), studying the [precipitation](https://en.wikipedia.org/wiki/Precipitation_(meteorology)), [evaporation](https://en.wikipedia.org/wiki/Evaporation), and [cycling](https://en.wikipedia.org/wiki/Water_cycle) of [water](https://en.wikipedia.org/wiki/Water). It is the second major component of the [Earth Observing System](https://en.wikipedia.org/wiki/Earth_Observing_System) (EOS) preceded by [Terra](https://en.wikipedia.org/wiki/Terra_(satellite)) (launched 1999) and followed by [Aura](https://en.wikipedia.org/wiki/Aura_(satellite)) (launched 2004).

The name "Aqua" comes from the [Latin](https://en.wikipedia.org/wiki/Latin) word for water. The satellite was launched from [Vandenberg Air Force Base](https://en.wikipedia.org/wiki/Vandenberg_Air_Force_Base) on May 4, 2002, aboard a [Delta II](https://en.wikipedia.org/wiki/Delta_II) [rocket](https://en.wikipedia.org/wiki/Launch_vehicle). Aqua operated in a [Sun-synchronous orbit](https://en.wikipedia.org/wiki/Sun-synchronous_orbit) as the third in the satellite formation called the "[A Train](https://en.wikipedia.org/wiki/A-train_(satellite_constellation))" with several other satellites ([OCO-2](https://en.wikipedia.org/wiki/OCO-2), the Japanese [GCOM W1](https://en.wikipedia.org/wiki/GCOM), [PARASOL](https://en.wikipedia.org/wiki/PARASOL), [CALIPSO](https://en.wikipedia.org/wiki/CALIPSO), [CloudSat](https://en.wikipedia.org/wiki/CloudSat), and [Aura](https://en.wikipedia.org/wiki/Aura_(satellite))) for most of its first 20 years; but in January 2022 Aqua left the A-Train (as Cloud Sat, CALIPSO and PARASOL had already done) when, due to its fuel limitations, it transitioned to a free-drift mode, wherein its equatorial crossing time is slowly drifting to later times, from its tightly controlled orbit.[[1]](https://en.wikipedia.org/wiki/Aqua_(satellite)#cite_note-1)

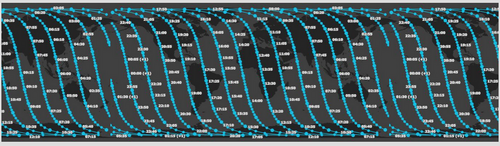
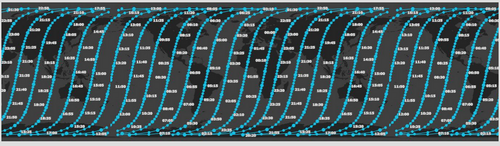
**Mission**

Aqua is one of NASA's missions for [Earth science](https://en.wikipedia.org/wiki/Earth_science) operating in the A-Train constellation. It has demonstrated a very high level of precision in making the primary long-term measurements of the mission. These highly calibrated climate quality measurements of radiance, reflectance, and backscatter have been used to cross-calibrate past and present sensors launched by NASA, as well as a variety of sensors launched from other agencies and the international community. Thousands of scientists and operational users from around the world have made use of the Aqua data to address NASA's 6 interdisciplinary Earth science focus areas: Atmospheric Composition, Weather, Carbon Cycle and Ecosystems, Water and Energy Cycle, Climate Variability and Change, and Earth Surface and Interior.

Aqua has experienced some minor, non-mission ending anomalies.

Because of a 2007 anomaly with the Solid State Recorder (SSR) it can only hold two orbits worth of data. A series of solar array and array regulator electronics anomalies starting in 2010 has led to the loss of 23 strings of solar cells out of a total of 132 strings.[[2]](https://en.wikipedia.org/wiki/Aqua_(satellite)#cite_note-2021review-2) A 2005 short circuit within a battery cell led to a partial loss of cell capacity. In 2009, a solar panel [thermistor](https://en.wikipedia.org/wiki/Thermistor) failed and an error in the Solar Array offset was detected. The offset issue has been corrected periodically since then. On September 8, 2007, the Dual Thruster Module (DTM-2) Heater experienced an anomaly.[[3]](https://en.wikipedia.org/wiki/Aqua_(satellite)#cite_note-2017Status-3) On August 16, 2020, The Formatter Multiplexer Unit (FMU) experienced an anomaly, corrupting some data in the SSR and stopping all data streams until it was recovered on September 2, 2020.[[4]](https://en.wikipedia.org/wiki/Aqua_(satellite)#cite_note-2020Status-4)

Aqua completed the last of its drag makeup maneuvers, mandated by fuel limitations, in December 2021 and entered a free-drift mode, slowly descending below the A-Train and drifting to later equatorial crossing times, and lower altitudes. For a time Aqua was a candidate for a life-extending re-fueling mission, but that was never attempted. The current end of mission plan is to begin passivation of the spacecraft in the fall of 2026.[[5]](https://en.wikipedia.org/wiki/Aqua_(satellite)#cite_note-5) A worst-case scenario would result in a re-entry by 2046.[[6]](https://en.wikipedia.org/wiki/Aqua_(satellite)#cite_note-6)

* Aqua's ascending orbital path as of 2021
*   
  Aqua's descending orbital path as of 2021