

# Aqua Status and 2020 Senior Review

(a very brief overview)

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A detailed presentation on the 2020 Aqua Senior Review process and findings will be given by Aqua Project Scientist Claire Parkinson on Thursday

<b>NASA 2020 Earth Science Senior Review</b> <i>National Interests Panel</i>		
<b>Rating</b>	<b>Definition</b>	<b>Missions</b>
<b>Very High Utility</b>	These missions have one or more very relevant and highly valued data products which are routinely used by one or more of the participating organizations for important activities. Loss of the data product(s) would have a significant negative impact on national on national agencies and organizations.	<i>Aqua, Terra</i>

<https://science.nasa.gov/science-red/s3fs-public/atoms/files/2020-NASA-ESSR-FullReportFINAL.pdf>

*(google Earth Science Mission Reviews)*

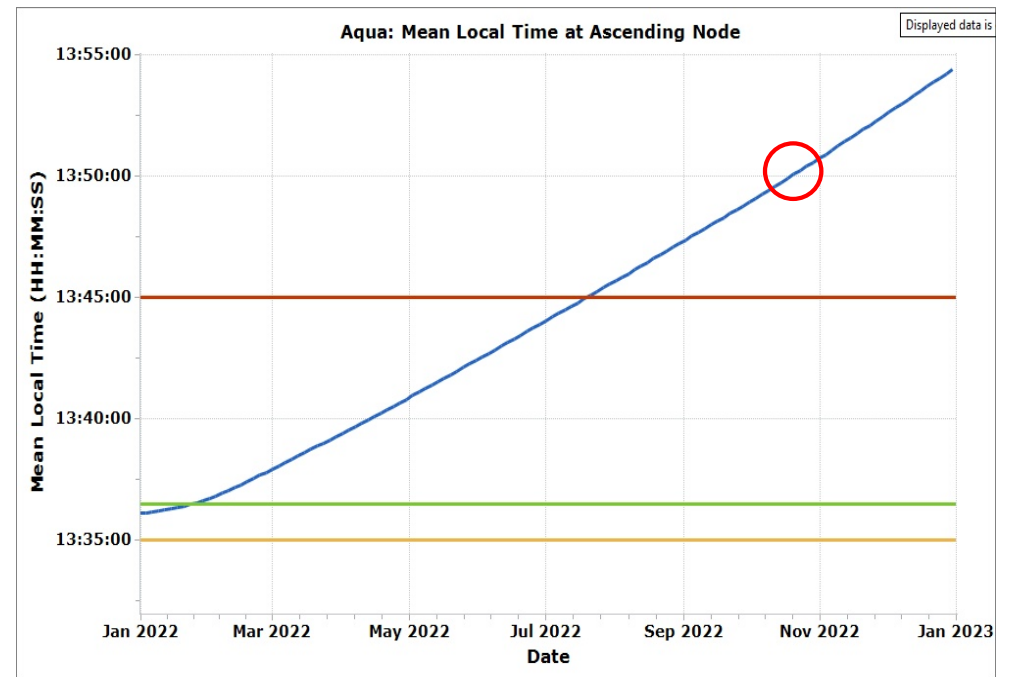
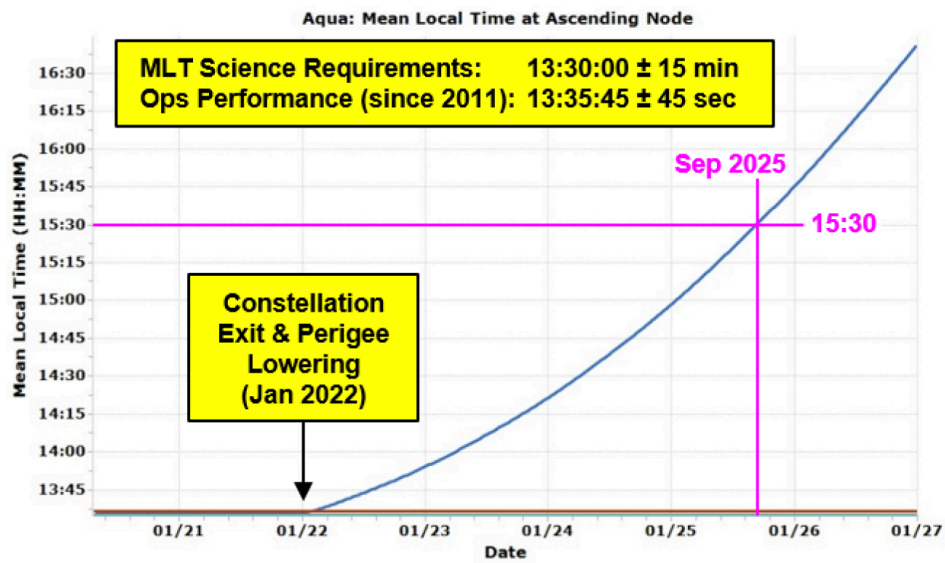
# Aqua Status

- Operating Instruments
  - AIRS: Excellent Health
  - AMSU: Fair Health
  - CERES: FM-3 excellent health; FM-4 good health
  - MODIS: Excellent health
- Significant Anomaly Aug. 16 – Sept. 2, 2020
  - CDH/FMU/SSR anomaly, resolved by “soft reset”
  - Only 27.5% of data recovered from DB
- Last series of Inclination Adjust Maneuvers (IAMs, to maintain MLT): Spring 2021
- *Currently* projected exit from constellation: January 2022
  - 25-year re-entry requirement, fuel-limited
  - MLT drift will commence because no more IAMs (see later)
- *Currently* Projected end of mission: September 2025
  - Power-limited
  - Subject to sufficient funding to continue operations

# Funding Status

- Latest is based on Aqua SR2020 guidance letter
- FY21-FY23 look good, ~900K below optimal request
  - Impact on algorithm maintenance, will be able to fund ~ at 90% level
  - 4 MODIS-atmosphere maintenance algorithms (all assigned to Aqua)
  - Similar relative reductions for Terra
- FY24-FY25 substantially below optimal request
  - To be revisited in SR2023 or upcoming annual budget exercises

# MLT drift



# MLT drift impacts

The Aqua Project is directed to conduct a **special review** of Aqua algorithms and data sets, no later than 2022, to **quantitatively assess** the anticipated impact of MLT drift on data product uncertainty, as well as the effectiveness of MLT drift mitigation strategies, for reconsideration in the 2023 Senior Review.

The Aqua Project is directed to **hold a Users' Workshop to communicate quantitative changes in the Aqua datasets**, to prepare users for the mission's end-of-life, including evaluation of continuity products.

## From SR2020 guidance letter

Due to fuel limitations, Aqua will lower its orbit and exit from the A-Train in January 2022. At that time, Aqua's mean local time (MLT) will start drifting from 1:30 PM to 3 PM by 2025. After that, the changes of MLTs and solar zenith angles may bring about significant changes in the quality, and consequently, the utility of the data, especially of the MODIS data. While only largely **qualitative preliminary estimates** of uncertainty based on expert knowledge were possible during the Senior Review, a **quantitative assessment needs to be established before the MLT drifts by more than 15 minutes**. Additionally, given that the uncertainty increase in specific Aqua products is deemed tolerable, **a Users' Workshop is needed** to communicate changes in the data sets and to prepare users for mission end-of-life, including the evaluation of continuity products. These findings support the score of Excellent for the proposed mission extension.

- Pertinent to all instruments
- Pertinent to all MODIS disciplines
- Relevant also to Terra
- Oreopoulos will lead special review
- JPL's Teixeira will organize the workshop, ~3Q/4Q of 2022.
- ***Will need your input, expertise, plans for quantitative assessment***