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Yes research paper for 2025 please

Good question. Here are a few recent (2024–2025) research papers on **Earth's Energy Imbalance (EEI)** — including ones that are very relevant for satellite (CERES) and ocean-based estimates:



Key 2025 / Very Recent Research on EEI

1. Mauritsen, T. et al. (2025) — "Earth's energy imbalance more than doubled in recent decades"

- **Journal:** AGU Advances [giss.nasa.gov +1](#)
- **Summary:** This is one of the most important recent papers. It finds that EEI has more than doubled in recent decades. [CentAUR](#)
- **Implications:** The observed trend in energy imbalance is steeper than many climate models predict — raising questions about processes like albedo change, clouds, and feedbacks.

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2. Crawford / Regime Change Study — *Regime Change in Top of the Atmosphere Radiation Fluxes*

- **Journal:** Climate (MDPI), 2025 [MDPI](#)
- **Summary:** Analyzes "regime shifts" in outgoing longwave radiation (OLR), net TOA flux, and other components from CERES EBAF data (Ed 4.2.1, 2001–2023) and compares with CMIP5 model simulations. [MDPI](#)
- **Take-Home:** They show that there are relatively abrupt shifts ("regime changes") in radiation fluxes, which could change how we think about the stability / timescales of EEI.

3. Forster, P. M. et al. (2025) — "Indicators of Global Climate Change 2024"

- **Journal:** Earth System Science Data (ESSD) [ESSD](#)
- **Summary:** This is a "state of the climate" indicators paper. It updates key indicators including EEI, based on the latest data. [ESSD](#)
- **Useful For:** If you want a broad, up-to-date view of how EEI fits into other climate metrics (ocean heat, forcing, etc.).

