In-Depth Analysis: N2O Emissions from Waste

1. Full-Series Trend (1970–2024): An Echo of the Methane Story

Nitrous Oxide (N2O) emissions from waste are a minor source, growing from ~**5 Mt CO2eq** in 1970 to ~**19 Mt CO2eq** in 2024. While small in scale, its primary importance is that its trend is a near-perfect echo of the much larger methane emissions from the same sector. It tells the identical story of accelerating growth driven by urbanization and consumption.

2. Breakpoint Detection: A Pattern of Acceleration

The analysis shows a clear pattern of accelerating growth, with the most recent period being the fastest. The slopes of the regimes are [**0.07 → 0.22 → 0.11 → 0.41**].

- **1970–1997:** The sector shows slow but accelerating growth.
- **1998–2004:** A brief slowdown occurs where the growth rate is halved.
- **2005–2024:** The final, long regime shows a return to acceleration, with the growth rate reaching its highest ever level at **0.41**. The post-COVID break is highly significant and appears to have further steepened this already strong trend.

3. Conclusions: A Confirmation of the Waste Problem

- **A "Little Brother" to Methane:** This trend serves as an independent confirmation of the story told by methane emissions from waste. Both gases show accelerating trends driven by the same root causes.
- **An Accelerating Problem:** The data confirms that emissions from unmanaged solid waste are an accelerating problem, with the post-COVID era seeing the fastest growth on record.
- **A Shared Solution:** While N2O is a smaller component, any policy aimed at tackling waste emissions—such as landfill gas capture, composting, or waste-to-energy projects—would have the co-benefit of mitigating both methane and nitrous oxide.