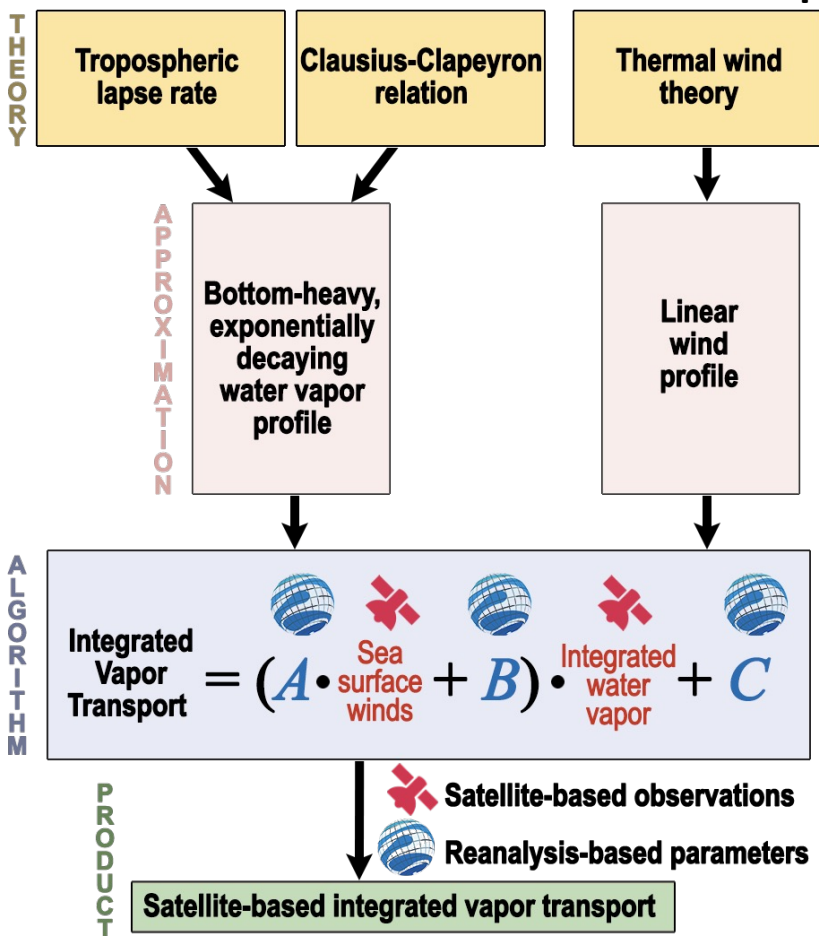# Atmospheric River Database Constructed Using Satellite Data
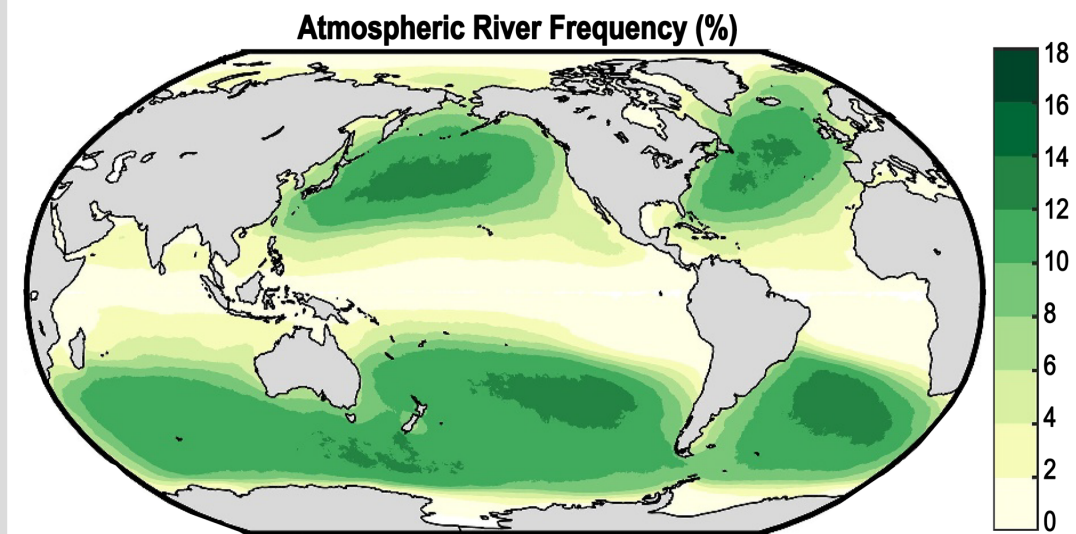
Our novel satellite-derived database has great potential to advance understanding of observed atmospheric rivers (AR).

Our novel algorithm reconstructs integrated vapor transport fields from two types of satellite data: sea surface winds and integrated water vapor. The **high spatial-temporal resolution** of the associated AR database presents an emerging opportunity to **re-assess relationships between AR features and observed extreme landfall precipitation.**

Overview of algorithm developed in this study.

$$\text{Integrated Vapor Transport} = (A \cdot \text{Sea surface winds} + B) \cdot \text{Integrated water vapor} + C$$

Key AR characteristics such as length, width, and area are well captured by our reconstruction algorithm. Compared to major atmospheric reanalyses, however, our database shows **significantly lower AR frequency in midlatitude regions**.

Atmospheric River Frequency (%)

Overall, our AR database **exhibits distinctive features including _fewer_ and _shorter_ ARs.** An example can be seen at right, which compares our satellite reconstruction to ERA5.

Integrated Vapor Transport Features

ERA5 True

ERA5 Reconstructed

Satellite Reconstructed

23-Dec-91 example