Distributed Proxy Signals and Rainfall Variability in Southern Australia

"EPS Observational Note 01"

Author	Michael A Jones
Email	Michael.jones@paleotech.com.au
ORCID account	https://orcid.org/0009-0000-4314-9073
Institution / Affiliation	PaleoTech Pty Ltd, Adelaide, South Australia, Australia
Department	PaleoTech Research Initiative
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Abstract

Environmental observations across atmospheric and hydrological domains frequently display patterns of variability associated with regional rainfall behaviour.

Within the **Earth Proxy System (EPS) framework**, such variability may be interpreted through distributed proxy observations reflecting interactions occurring within the coupled Earth system.

This observational note examines the relationship between **Subtropical Ridge (STR) variability** and rainfall patterns across selected locations in southern Australia.

The analysis demonstrates that rainfall variability may correspond with broader atmospheric regime behaviour observable through distributed environmental signals.

1. Introduction

Rainfall variability across southern Australia is influenced by large-scale atmospheric circulation patterns. One of the dominant circulation features affecting the region is the **Subtropical Ridge (STR)**.

Variations in the position and intensity of the STR influence frontal systems, storm tracks, and moisture transport affecting rainfall distribution across southern Australia.

Within the **EPS framework**, such atmospheric behaviour may be interpreted through distributed proxy observations appearing across environmental datasets.

2. Observational Data

Observational data examined in this note include:

- STR latitude variability
- STR intensity indicators
- rainfall observations from selected stations

Stations examined include representative rainfall locations across southern Australia.

The purpose of this observational note is not to establish predictive models but to examine **observational relationships between atmospheric regime behaviour and rainfall variability**.

3. Observational Relationships

Preliminary analysis indicates that rainfall variability may correspond with patterns of STR behaviour.

Examples include:

- shifts in STR latitude associated with changes in rainfall frequency
- variations in ridge intensity corresponding with rainfall suppression or enhancement
- temporal relationships between atmospheric regime changes and rainfall events

These relationships illustrate how rainfall variability may correspond with **broader atmospheric system behaviour**.

4. EPS Interpretation

Within the EPS framework, these observations may be interpreted as:

- distributed proxy observations corresponding with Earth-system variability

In this context:

- STR behaviour represents an atmospheric proxy signal
- rainfall observations represent hydrological proxy signals

Together they form part of a distributed observational pattern reflecting broader Earth-system variability.

5. Implications

The observational relationship between atmospheric circulation behaviour and rainfall variability illustrates how environmental signals appearing across multiple domains may correspond with Earth-system dynamics.

Within the EPS perspective, such observations may be interpreted as **distributed proxy expressions of Earth-system variability**.

6 Conclusion

This observational note illustrates how rainfall variability across southern Australia may correspond with atmospheric regime behaviour observable through distributed environmental signals.

Such relationships are consistent with the **EPS conceptual framework**, which proposes that Earth-system variability may manifest through distributed proxy observations across environmental domains.