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Impact of summer-persistent ENSO events on the global climate and the occurrence of extreme weather events



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Key points

- **Summer-persistent ENSO events** have **occurred** in the recent past.
- Temperature and precipitation patterns of the ENSO events indicate **similarities during winter** and **differences during the summer**.

1 Summer ENSO: A persistent ENSO variation

- Some ENSO events tend to **persist longer** than usual, e.g., the El Niño in 2018/19 (Fig. 1).
- We hypothesize that summer-persistent ENSO events have **severer impacts** on the global climate. Consequently, triggering **more extreme weather events** compared to conventional ENSO events.
- Our goal is to **identify** summer-persistent ENSO events, **quantify** their climate impact and **link** extreme weather events to them.

2 Summer-persistent ENSO events

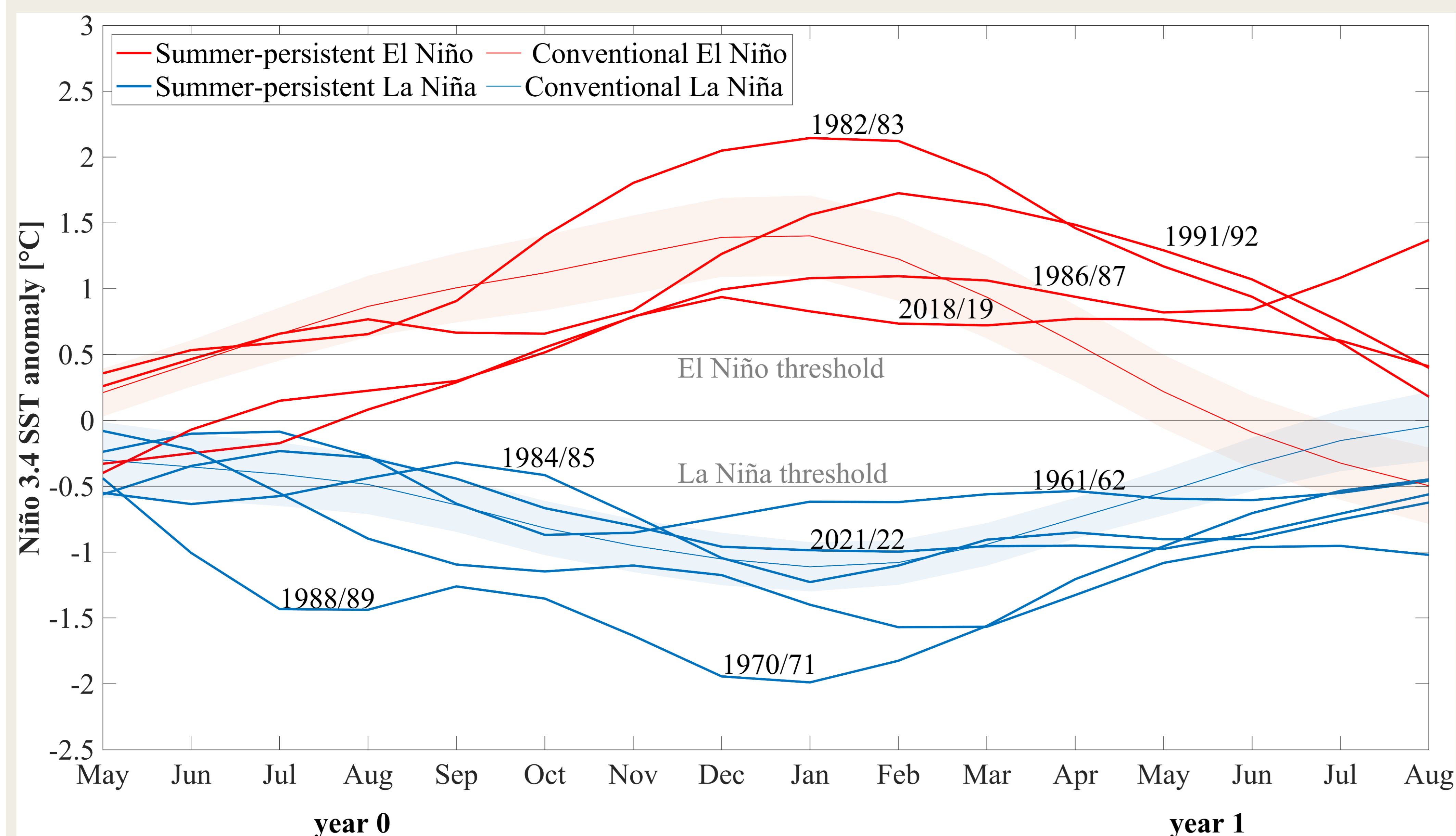


Fig. 1: Identified summer-persistent ENSO events (red and blue solid lines) since 1950 based on sea surface temperature anomalies in the Niño3.4 region. Shadows represent composites of conventional El Niño (red) and La Niña (blue) events.

3 Climate response of summer-persistent and conventional ENSO events

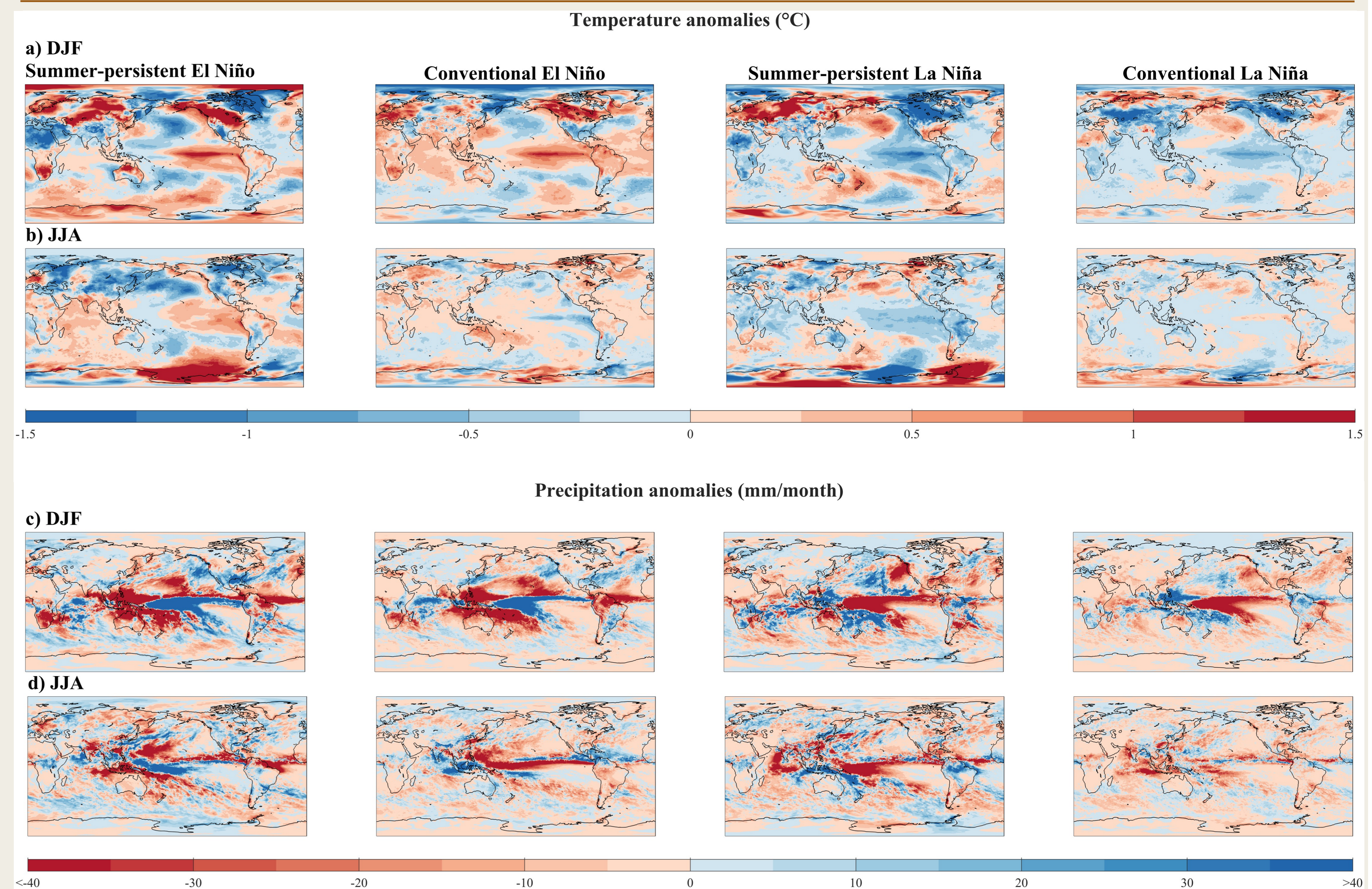


Fig. 2: Composites of median monthly temperature (°C) (a-b) and precipitation anomalies (mm/month) (c-d) of summer-persistent and conventional ENSO events in winter (DJF) (a,c) and summer (JJA) (b,d).

4 Challenges

- Link climate responses to summer-persistent ENSO events.
- Find suitable method to detrend daily data to compare the occurrence of extreme weather events between ENSO types.
- Link occurrence of extreme weather events to summer-persistent ENSO events.

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