On the mechanisms that give rise to predictive skill on seasonal-to-decadal timescales

Jon Robson
j.i.robson@reading.ac.uk

@JonIRobson
On the mechanisms that give rise to predictive skill on seasonal-to-decadal timescales: with a focus on the North Atlantic

Jon Robson

j.i.robson@reading.ac.uk @JonIRobson

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Why study mechanisms in S2D?

- Can we expect similar skill in the future?
- Prediction is the ultimate test of our knowledge
  - S2D has highlighted that models underestimate the predictable signal in NAO
- S2D data sets are huge! Novel ways to assess the processes in models?

Shaffrey et al, 2017
Mechanisms/processes that give rise to S2D skill
Mechanisms/processes that give rise to S2D skill

ENSO

(a) NCEP@DJF(0)
Mechanisms/processes that give rise to S2D skill

ENSO

Precip - ACC attributable to ENSO
DePreSys3 1990-2015 – 40 members, Nov start

Courtesy Paul-Arthur Monerie and Nick Dunstone
Mechanisms/processes that give rise to S2D skill

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AMOC

Var. = 38.9%

EOF1 SLP

DJF 1899-2018

North Pacific EOF1

North Atlantic
Mechanisms/processes that give rise to S2D skill

**ENSO**

- a) NCEP@DJF(0)

**AMOC**

- EOF1 SLP
- DJF 1899-2018
- Var. = 38.9%

**QBO**

- North Pacific EOF1
- North Atlantic
Mechanisms/processes that give rise to S2D skill

**ENSO**
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Mechanisms/processes that give rise to S2D skill

- ENSO
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![ENSO Map](image)

![AMOC Map](image)

![QBO Map](image)

![External Forcing](image)
Mechanisms/processes that give rise to S2D skill

**ENSO**

(a) NCEP@DJF(0)

**AMOC**

**QBO**

**EXTERNAL FORCING**

- NATURAL
- MAN-MADE
Mechanisms/processes that give rise to S2D skill

- ENSO
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External Forcing:
- Natural
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Mechanisms/processes that give rise to S2D skill

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EXTERNAL FORCING
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Mechanisms/processes that give rise to S2D skill

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Diagram showing connections between ENSO, AMOC, and QBO, as well as external forcing categories (natural and man-made).