

ENSEMBLES stream-1 hindcasts: from the season to the decade with four coupled models

Michel Déqué

Météo-France CNRM

7 November 2007

1 Month to Year

2 Year to decade

ENSEMBLES RT2A

- After DEMETER
- stream 1 as a draft (now complete)
- stream 2 as DEMETER revisited (in progress)
- New feature of stream 1 : ensemble methods
- New feature of stream 1 : extension of the forecast range

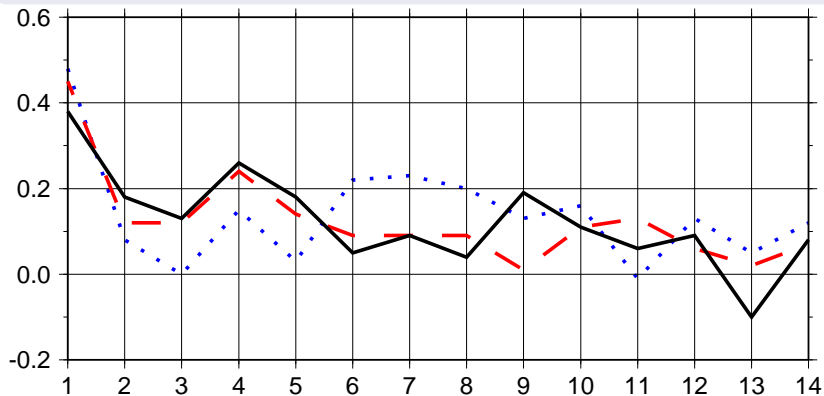
Stream-1 design

- Four models : ECMWF, Met Office, Météo-France, IfMK (not decadal)
- Two seasons/year : start 1 November and 1 May
- Eleven years : 1991-2001
- Two ensemble methods : perturbed parameterizations (MetO) stochastic physics (ECMWF)
- forecast range : 7 months (May start) and 14 months (Nov start)
- Two decadal forecasts : Nov 1965 and Nov 1994
- Here : restriction to Z500 20N-80N
- Comparison of 3 ensemble methods : PP, SP and MM with 9 members

Winter scores (ACC)

monthly means

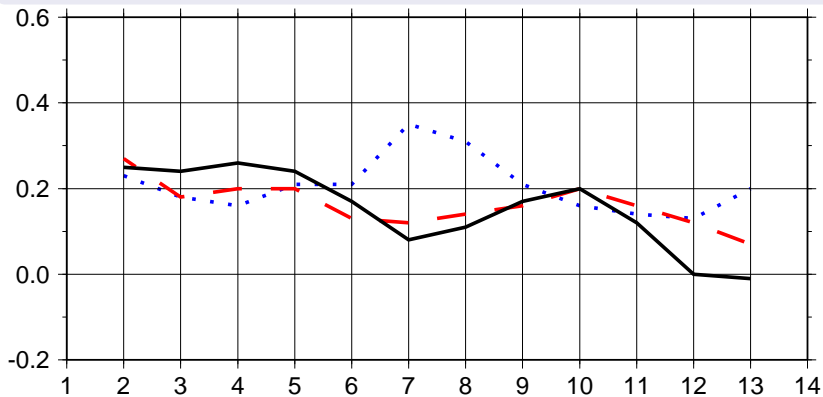
Perturbed Parameterizations Stochastic Physics Multi-Model



Winter scores (ACC)

seasonal means

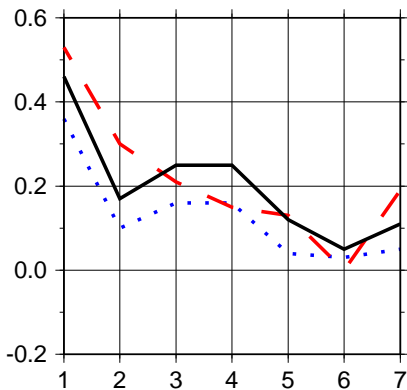
Perturbed Parameterizations Stochastic Physics Multi-Model



Summer scores (ACC)

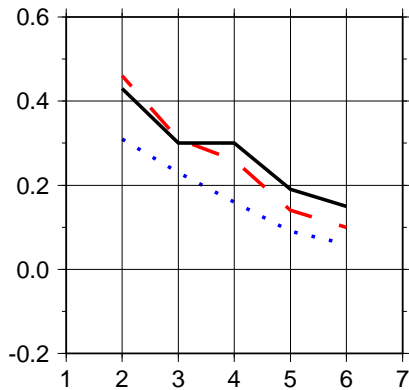
monthly means

PP SP MM



seasonal means

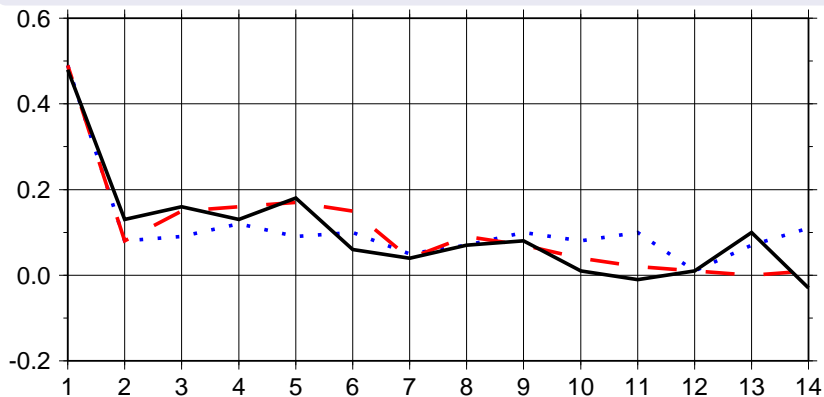
PP SP MM



Winter spread (ACC)

monthly means

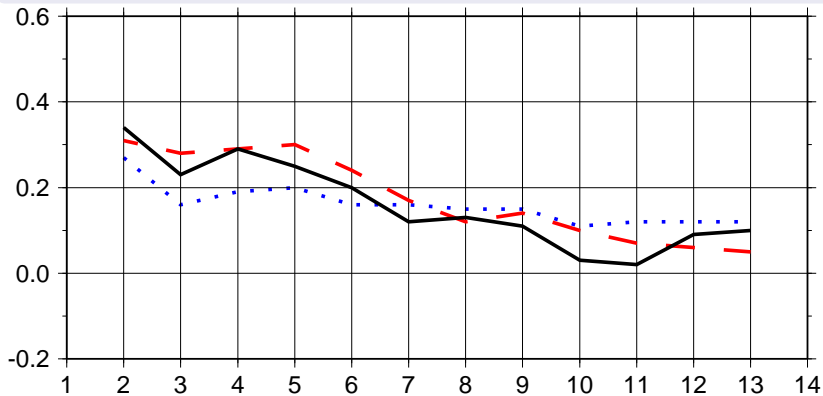
Perturbed Parameterizations Stochastic Physics Multi-Model



Winter spread (ACC)

seasonal means

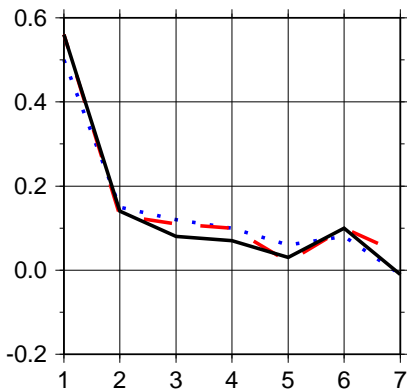
Perturbed Parameterizations Stochastic Physics Multi-Model



Summer spread (ACC)

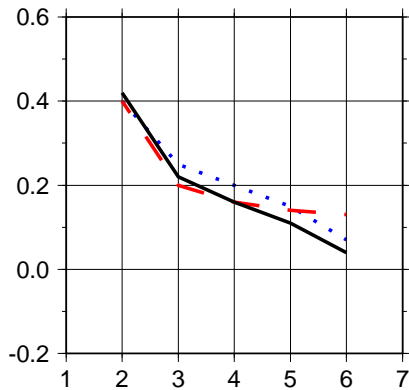
monthly means

PP SP MM



seasonal means

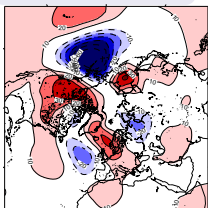
PP SP MM



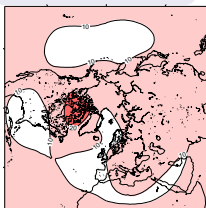
Decade 2- Decade 1

Z500 1995-2004 minus 1966-1975 means

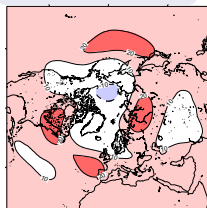
ERA40



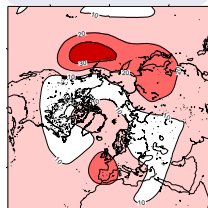
Météo-France



ECMWF



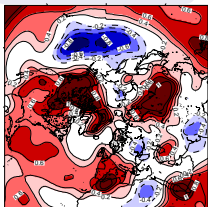
Met Office



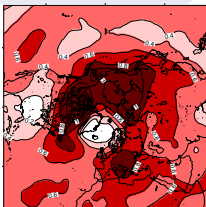
Decade 2- Decade 1

T850 1995-2004 minus 1966-1975 means

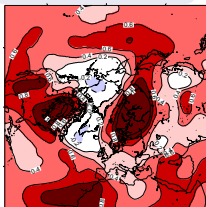
ERA40



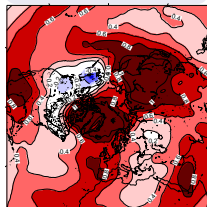
Météo-France



ECMWF



Met Office



Conclusions

- As far as NH 500 hPa is concerned
- Given the short sample size (11 cases)
- PP, SP and MM give similar skill (measured by ACC)
- PP, SP and MM give similar spread (measured by ACC)
- No decadal predictability for Z500
- But some decadal predictability for temperature at hemisphere scale