

Monsoon Predictability and the DEMETER Project

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(ECMWF)*

Outline

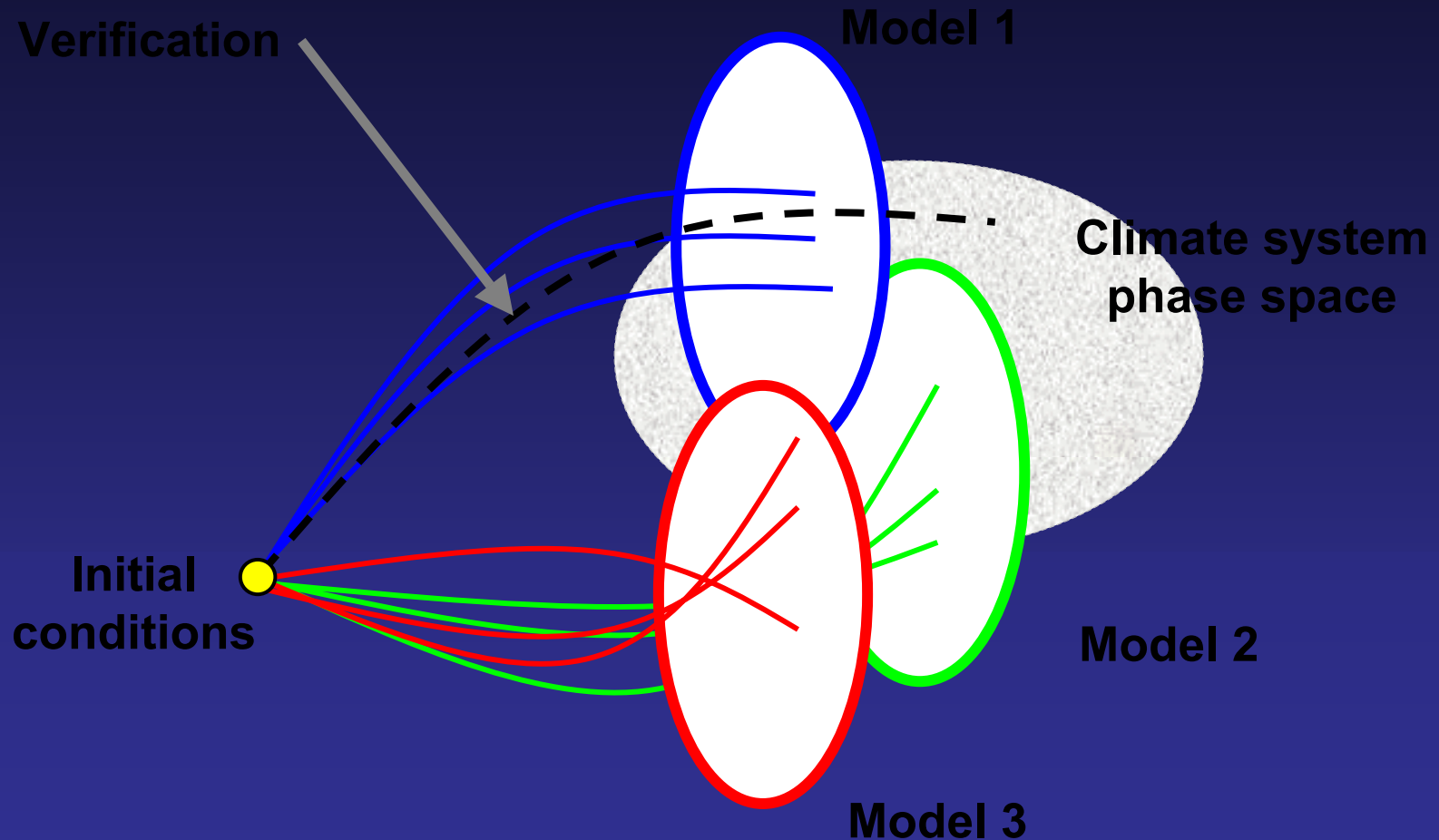
- DEMETER: An overview
- Project status
- First results: ENSO
- Indian monsoon

DEMETER project

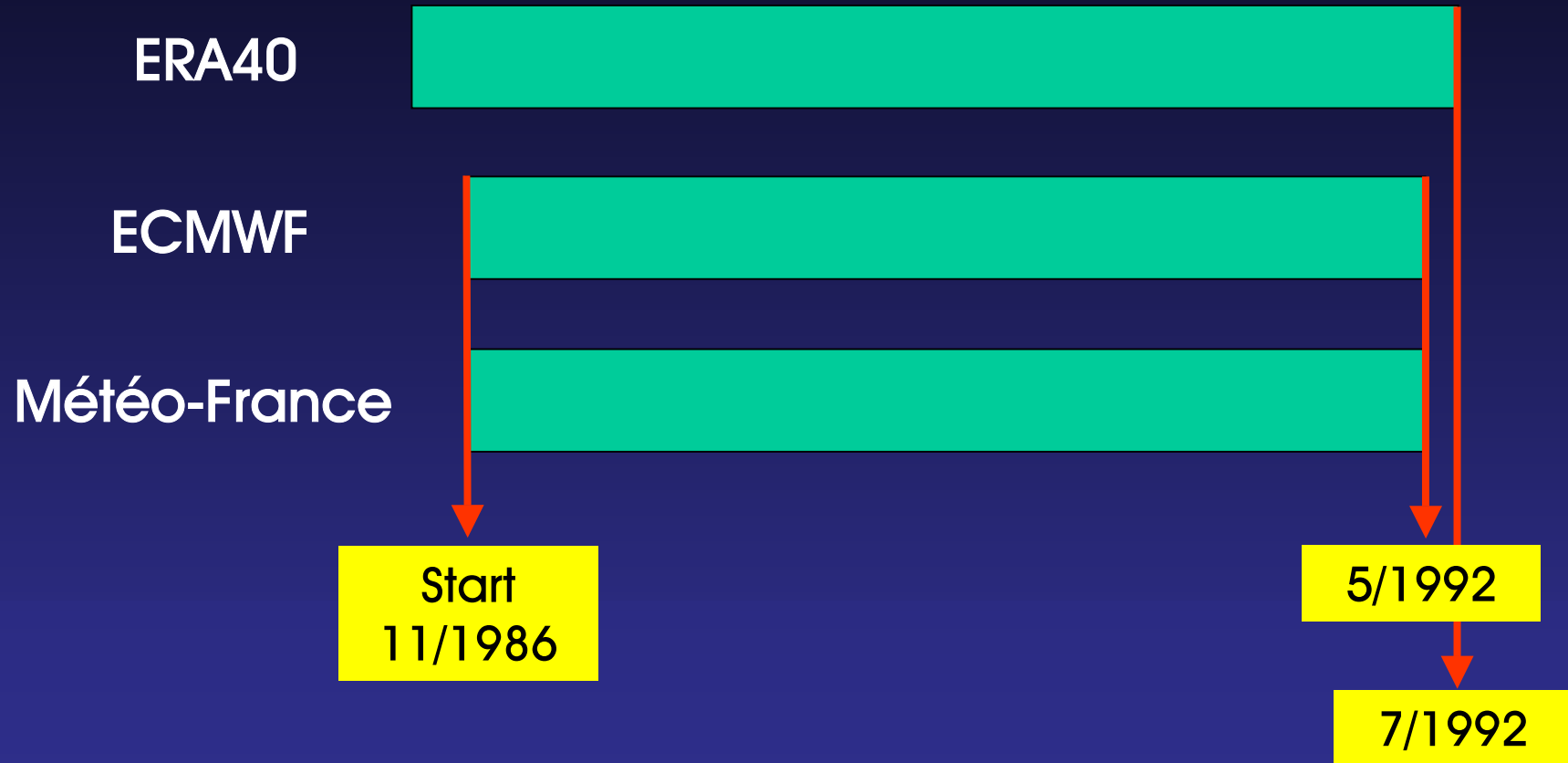
- Multimodel coupled seasonal forecasting experiment
- Main focus: 1987-1999, secondary focus: 1969-1986
- 9-member ensembles, 6-month simulations, 4 seasons, SST and wind perturbations, ERA-40 initial conditions
- Downscaling; crop yield and human health applications
- Availability of data in quasi-real time
- Website:
www.ecmwf.int/research/demeter/

Country	Atmosphere	Ocean
<i>Int</i>	<i>ECMWF</i>	<i>HOPE</i>
<i>France</i>	<i>ECMWF</i>	<i>OPA</i>
<i>France</i>	<i>ARPEGE</i>	<i>OPA</i>
<i>Italy</i>	<i>ECHAM</i>	<i>OPA</i>
<i>Germany</i>	<i>ECHAM</i>	<i>HOPE</i>
<i>UK</i>	<i>UM</i>	<i>UM</i>

Multi-model: Forecasting an event



Status of the integrations



Production rates

DEMETER (ECMWF): 1-3 days / 6 month hindcast

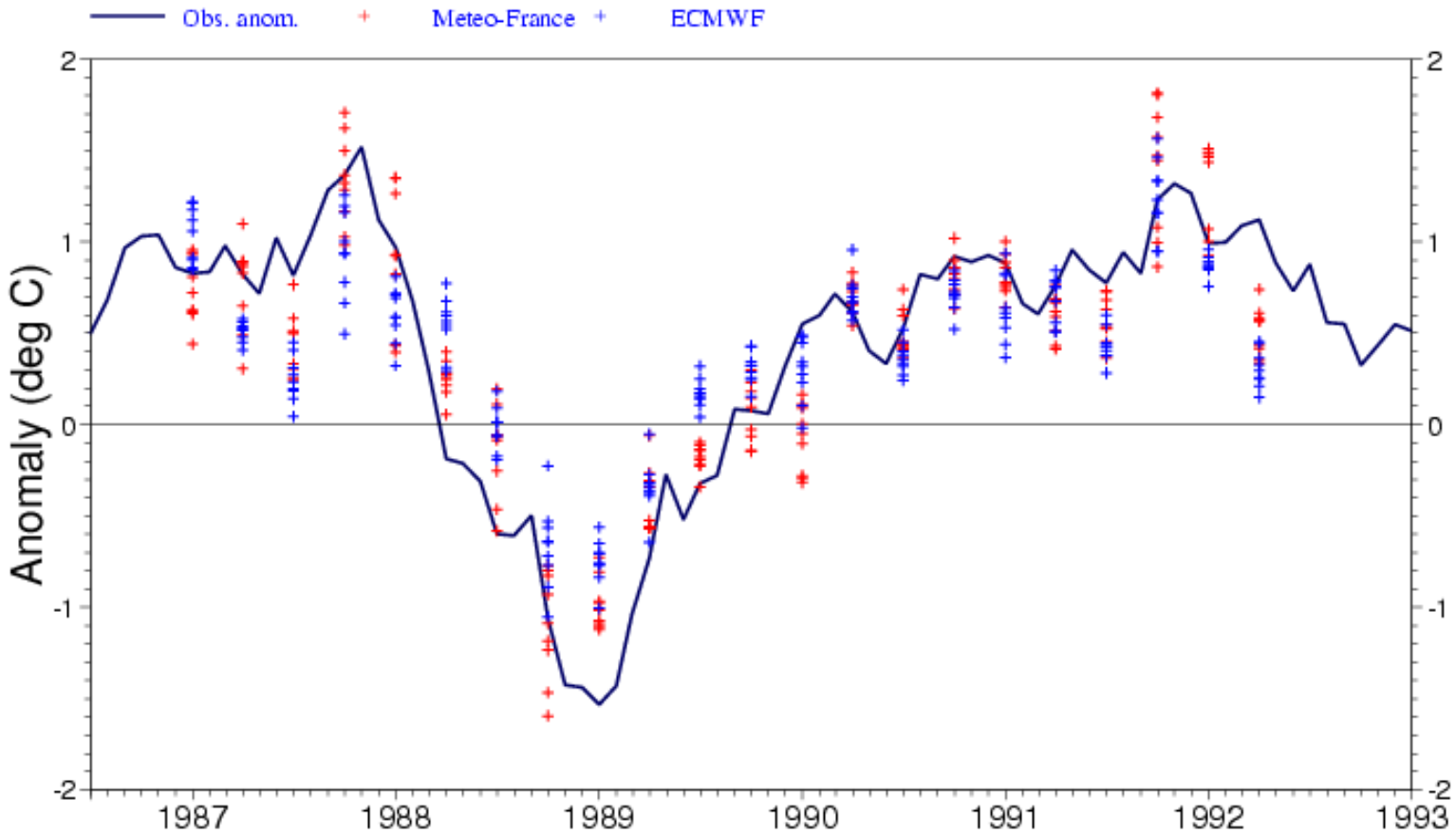
ERA-40: 3 days / 1 month analysis (6/1992)

ENSO

NINO4 SST forecast anomalies

ECMWF forecasts at month 3

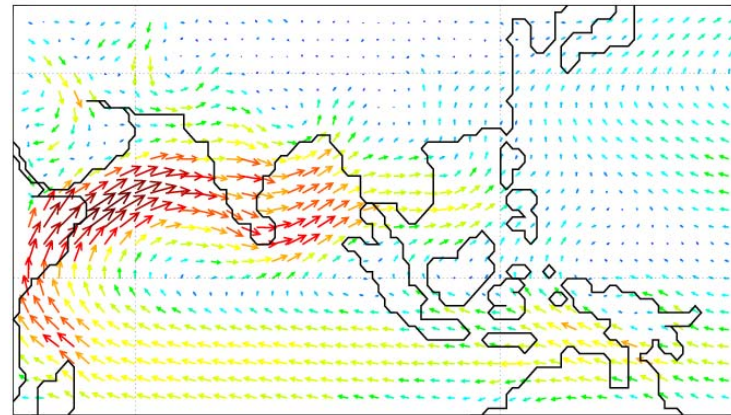
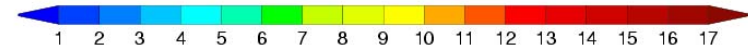
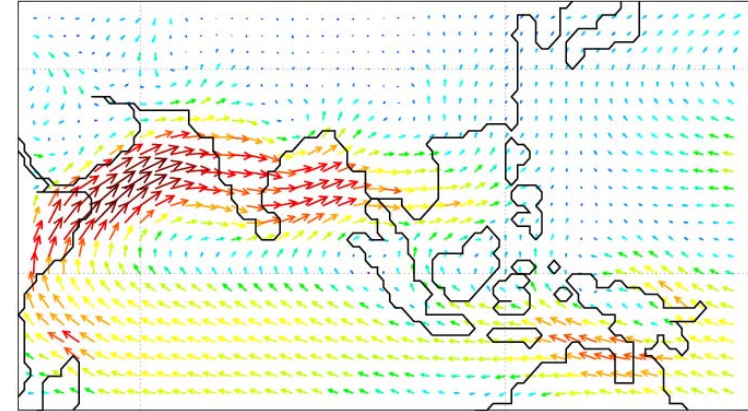
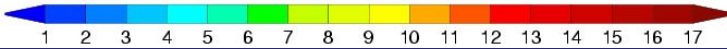
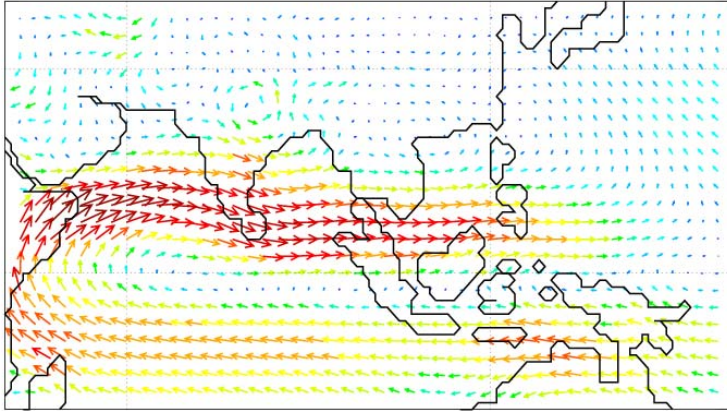
Ensemble sizes are 9 (Meteo-France) and 9 (ECMWF) SST obs: NCEP 2dvar



Asian Monsoon (850 hPa wind, JJAS)

Meteo-France

ECMWF

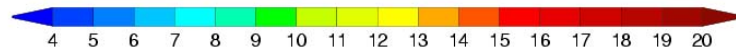
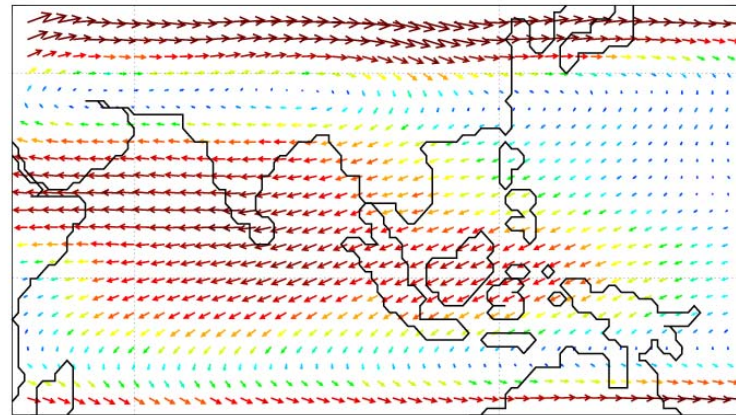
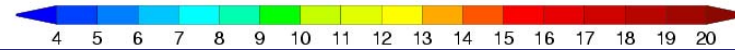
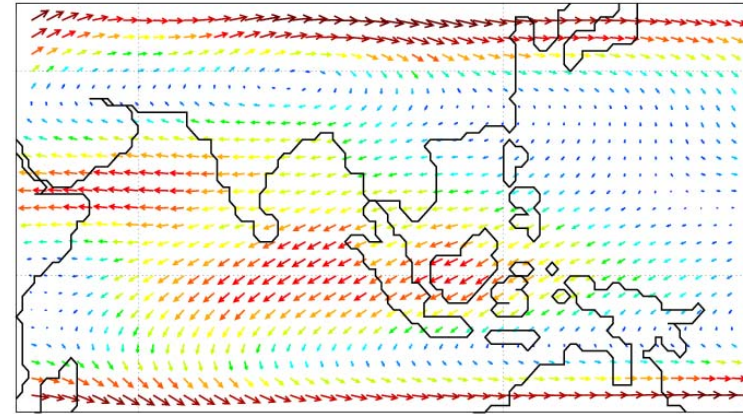
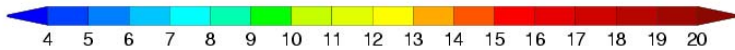
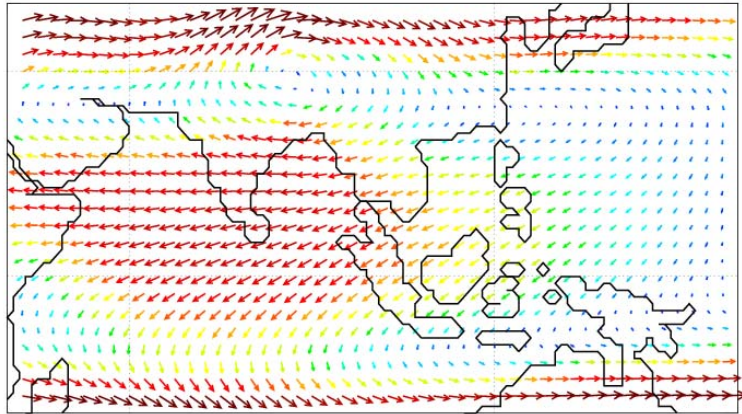


ERA40

Asian Monsoon (200 hPa wind, JJAS)

Meteo-France

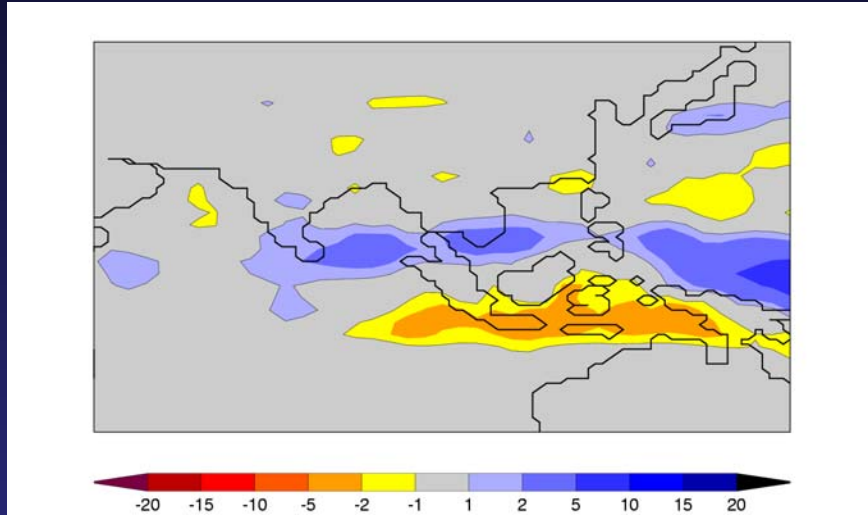
ECMWF



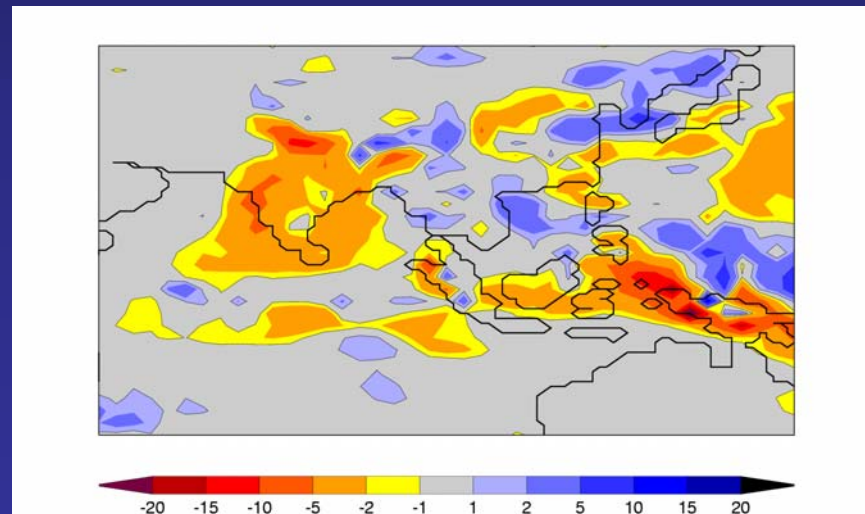
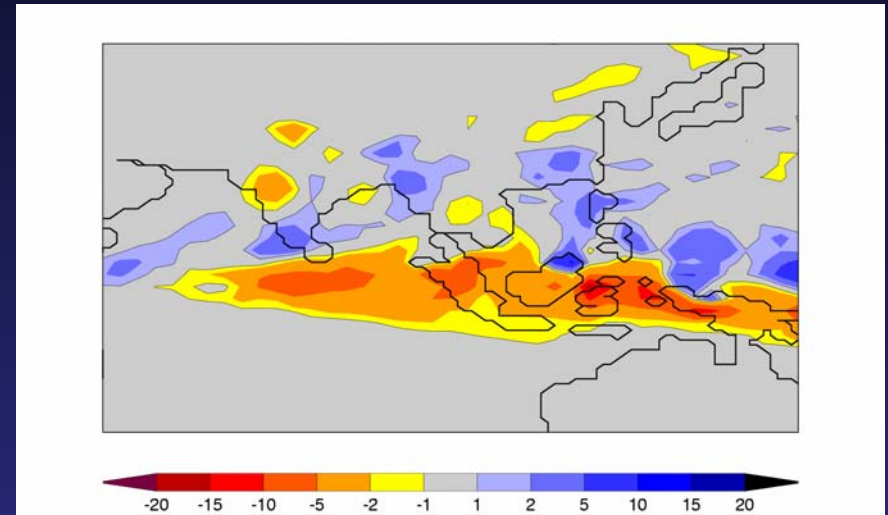
ERA40

Asian Monsoon 87-88 (JJA)

Meteo-France



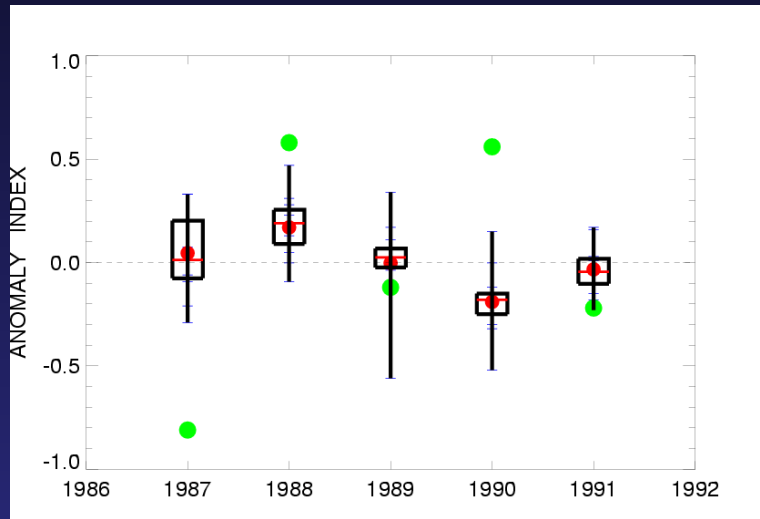
ECMWF



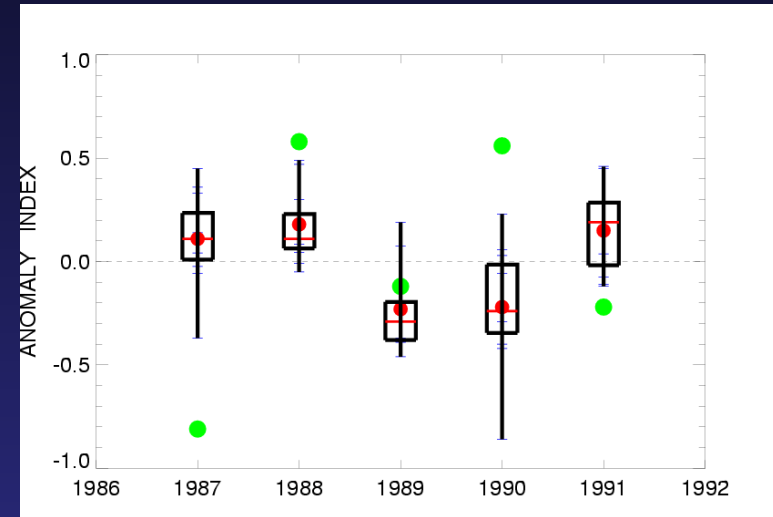
ERA40

All Indian Rainfall (60-120E, EQ-30N)

Meteo-France



ECMWF

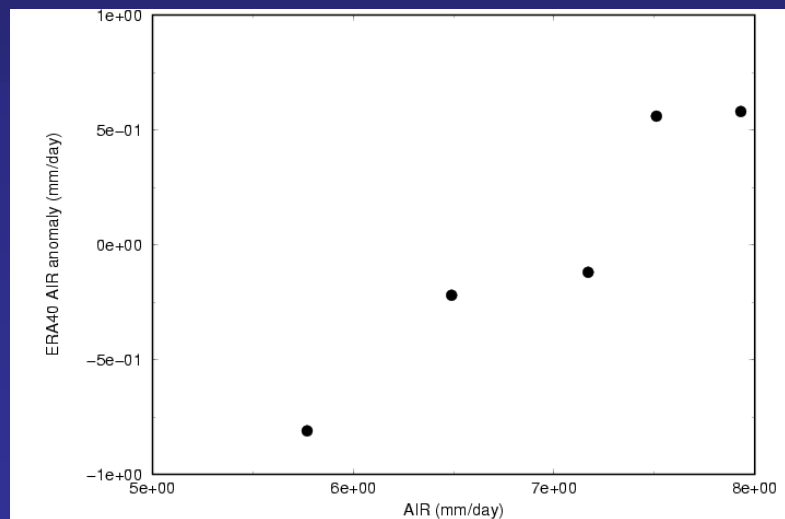


Aver. AIR (mm/day)

ERA40 4.6

MF 6.1

ECMWF 7.2

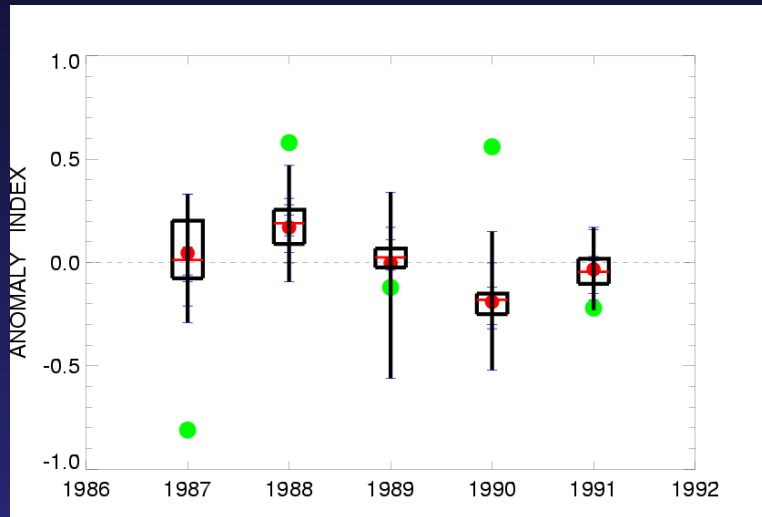


1987-1991 AIR

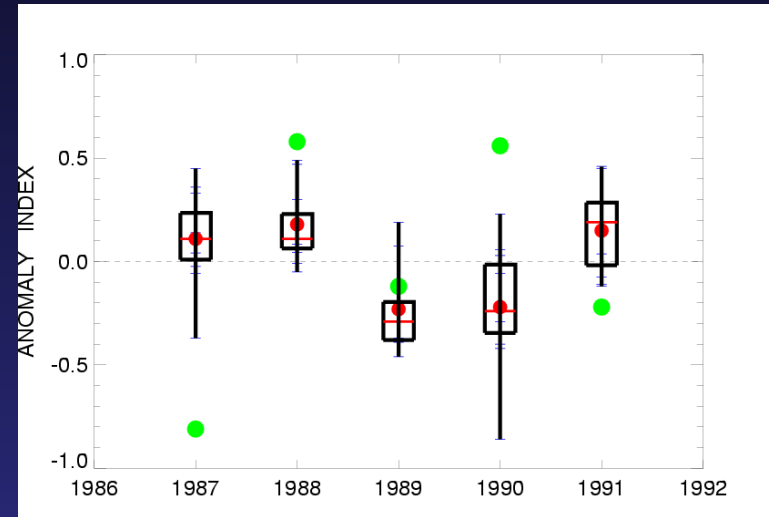
Indian Institute of
Tropical Meteorology
vs ERA40 anomalies

U-Shear Index (60-120E, EQ-30N)

Meteo-France



ECMWF



Average U index (m/s)

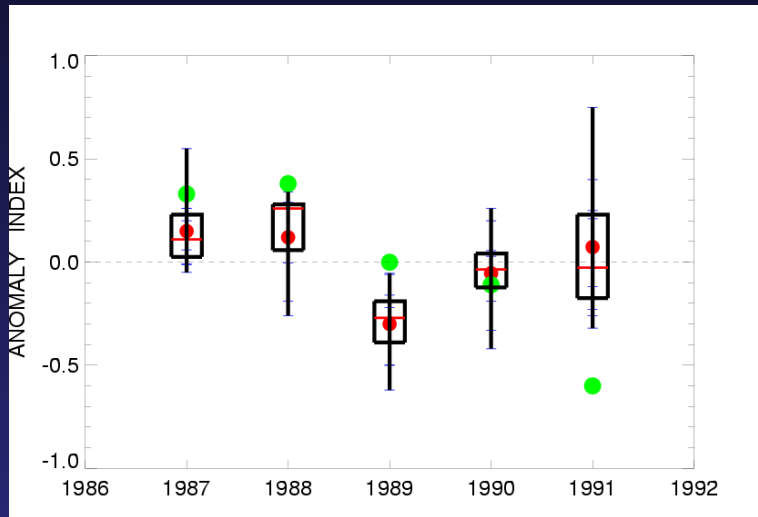
ERA40 12

MF 21

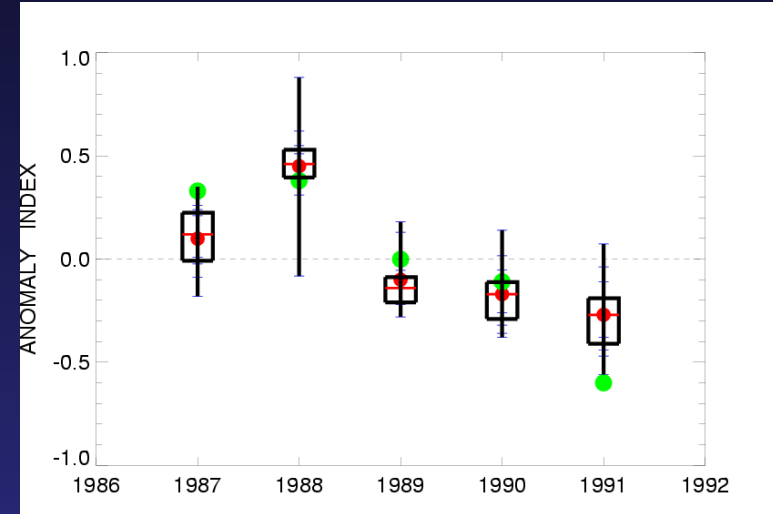
ECMWF 17

V-Shear Index (40-140E, 15S-25N)

Meteo-France



ECMWF



Average V index (m/s)

ERA40 2.9

MF 4.8

ECMWF 5.6

Summary

- Hindcast production has started and it is running with a higher production rate than ERA40.
- Bias is strongly model dependent.
- Models are able to reproduce 87-88 signal.
- Dynamical indices show encouraging results. However, rainfall skill is low.