



# DEMETER activity at the INGV: hindcasts results with the INGV CGCM

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## Plan of the talk:

- DEMETER progress at INGV (Jun.-Nov. 2002)
- preliminary results from our hindcasts
- current activity & future plan

May 2002: 5-member hindcast ensembles for the period 1987-1994

June 2002:

- found an error in the ocean analysis (error in the routines used to interpolate the ERA fluxes onto the ocean model grid).
- wrong oceanic initial conditions with substantial impact on the coupled simulations.
- decided to re-make the entire work (ocean analysis and coupled simulations) from scratch.

July-September 2002:

- production of a new ocean analysis.
- the ocean model has been forced for the period 1982-98, using ERA-15 data where ERA-40 were not available yet (1982-86).
- 2 ocean runs have been performed with positive and negative wind perturbations for the period 1986-98.

### October 2002:

- 9 initial conditions (8 perturbed and 1 unperturbed) available for the period 1987-98

### October-November 2002:

- production of 9-member hindcast ensembles.
- hindcasts for the period 1987-1997 available

### late November 2002:

- archiving on MARS

# HINDCAST PRODUCTION

Hindcasts have been performed for the period **1987-1997**

Atmospheric forced (GISST) run

Ocean analysis

For each year, 4 initial conditions:  
February, May, August and November

**SST**  
perturbations

**WIND**  
perturbations

**9 perturbed i.c.** for  
each month, each year

ensembles of 9 hindcasts, each integration 6 months long

# The SINTEX CGCM

**ECHAM-4:** MPI - Hamburg (Roeckner et al.1996)

- global
- T42 (128 x 64 GG) ~ 2.8°
- 19 vertical levels

**ATMOSPHERE**  
**ECHAM-4**

**COUPLER: OASIS**

**OCEAN**  
**OPA**

**OPA 8.1:** Lodyc - Paris (Madec et al. 1998)

- global
- 2° longitude; 0.5 - 2° latitude
- 31 vertical levels
- climatological sea-ice

**FLUXES and SST exchanged every 2 hours**

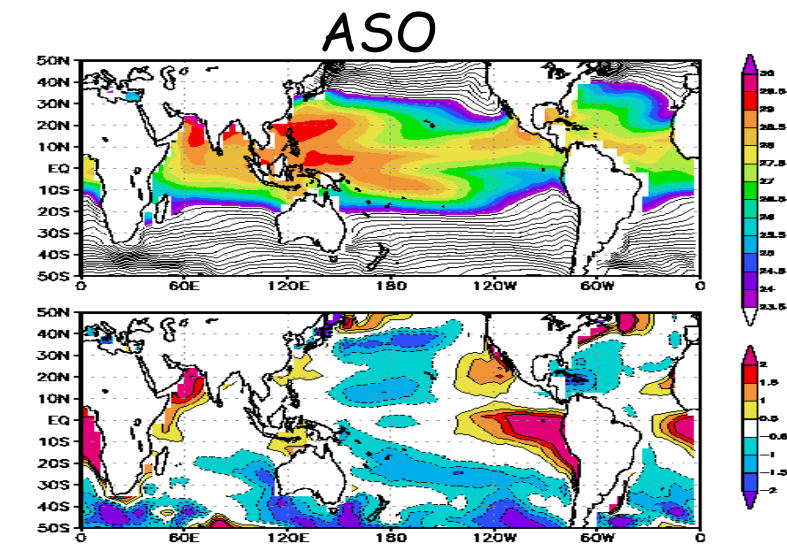
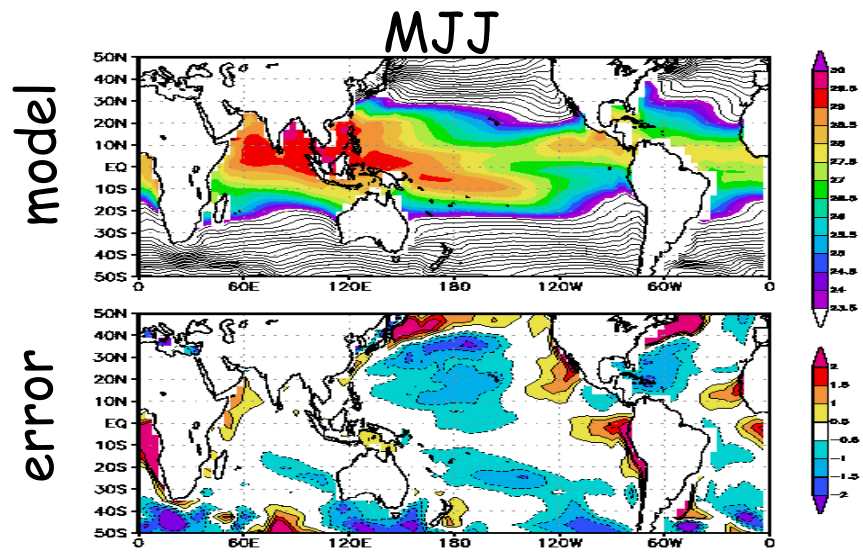
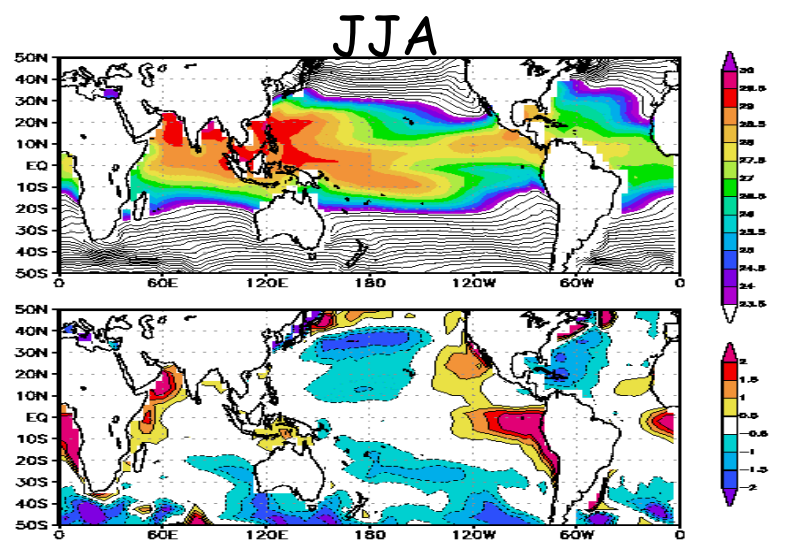
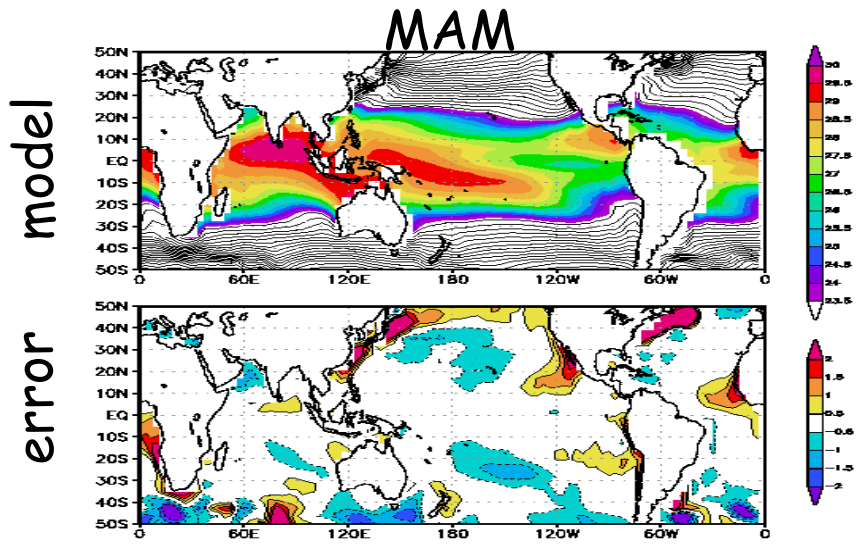
**NO FLUX CORRECTIONS**

# Model bias

SST

Feb Hindcasts

May Hindcasts



# Model bias

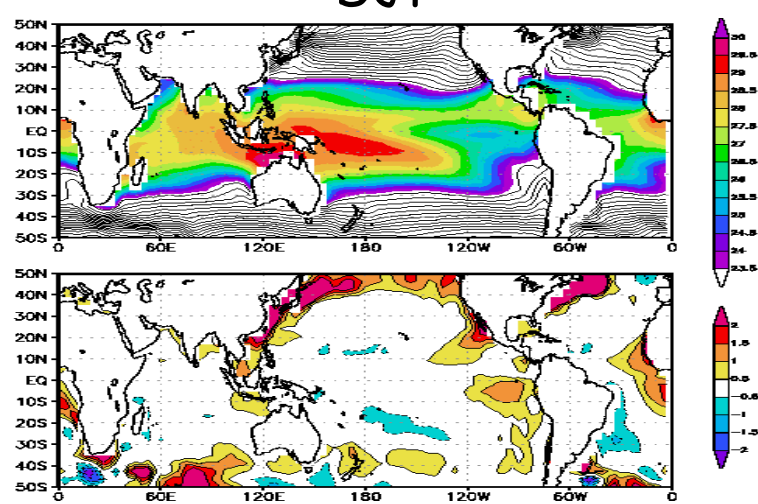
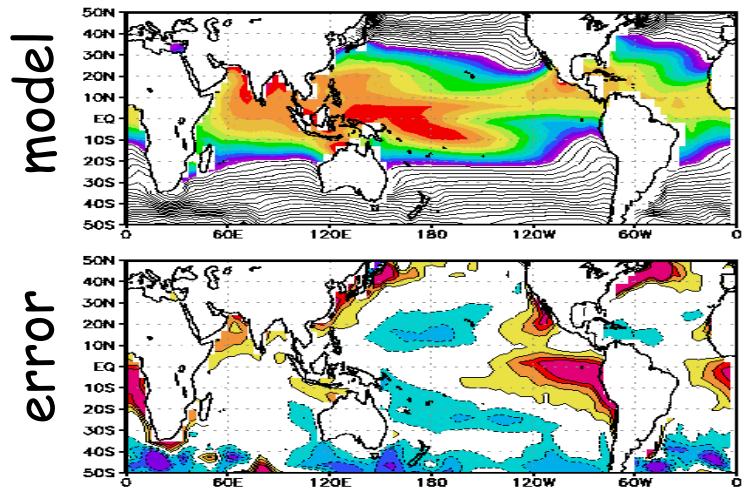
SST

Aug Hindcasts

Nov Hindcasts

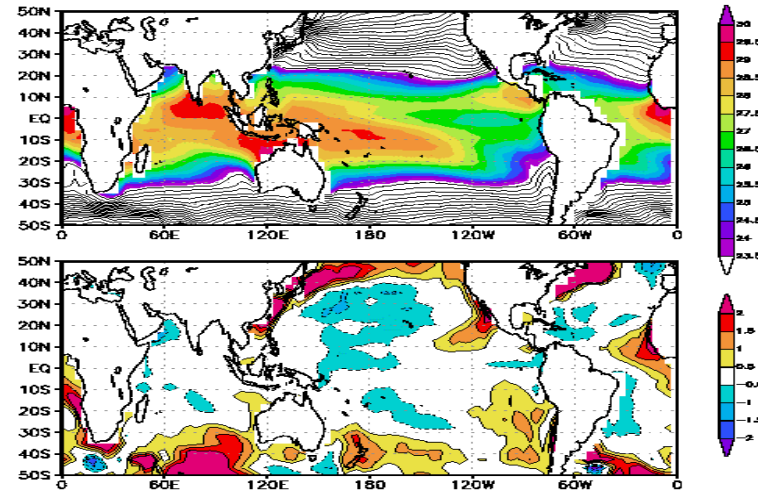
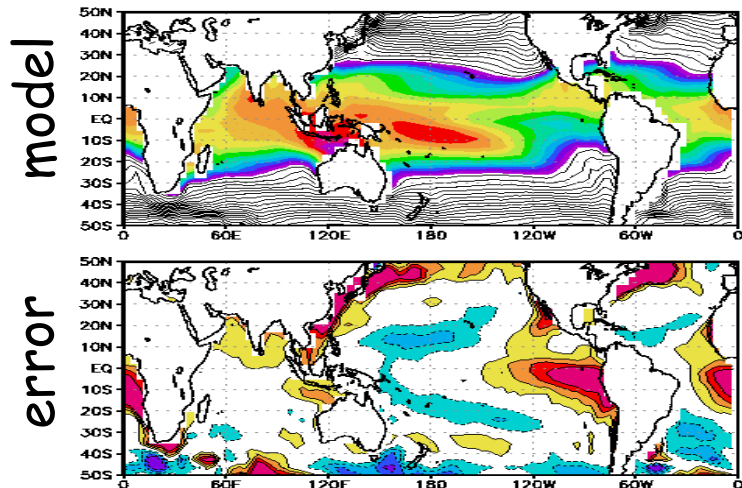
SON

DJF



NDJ

FMA



# Model bias

PRECIP

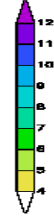
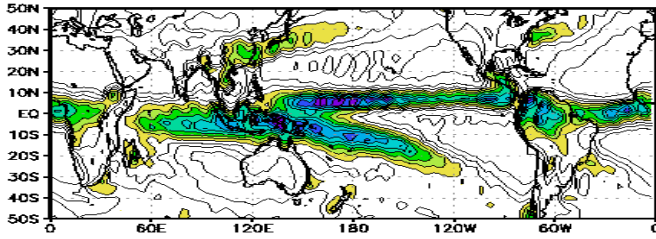
Feb Hindcasts

May Hindcasts

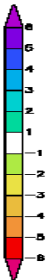
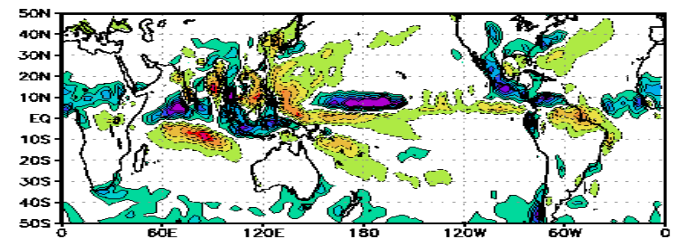
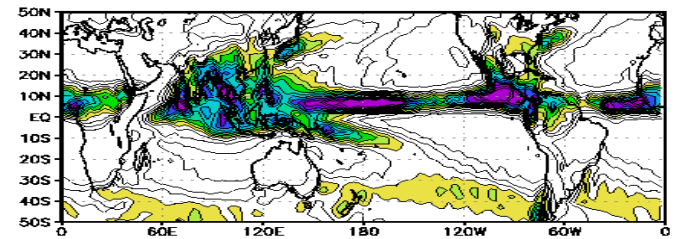
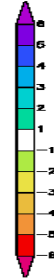
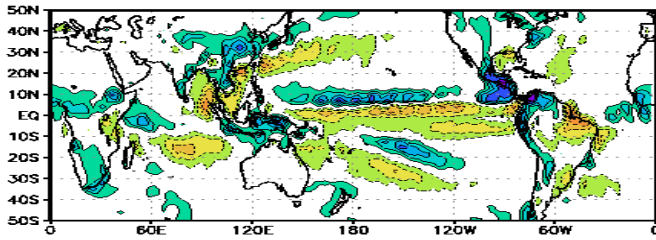
MAM

JJA

model



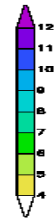
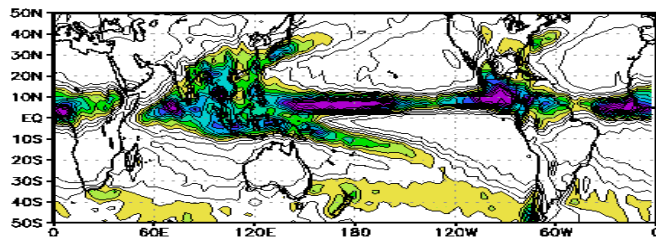
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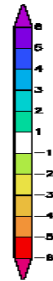
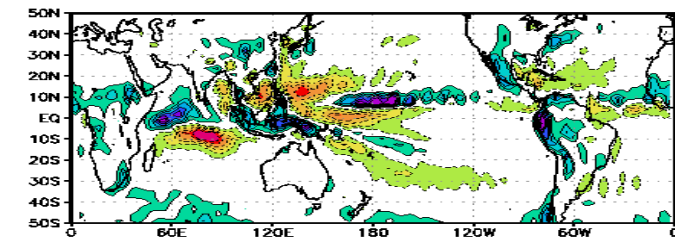
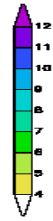
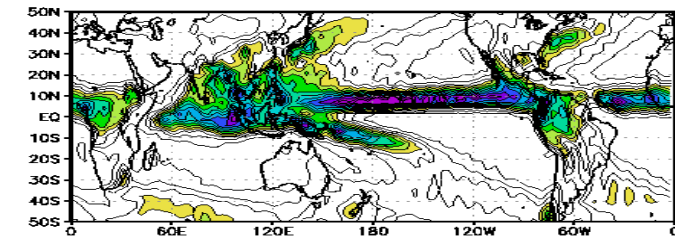
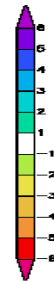
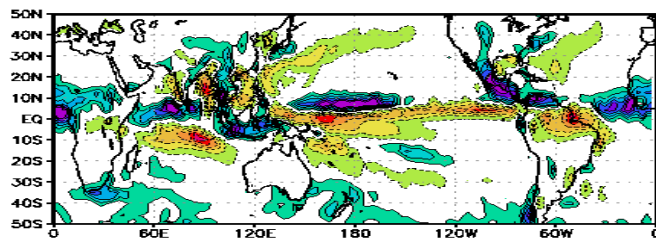
model

MJJ

ASO



error



# Model bias

PRECIP

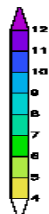
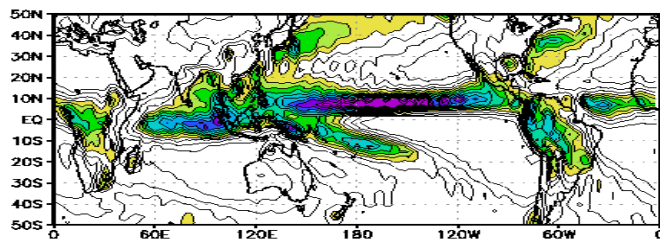
Aug Hindcasts

Nov Hindcasts

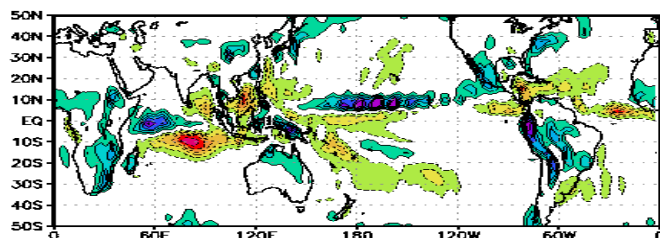
SON

DJF

model



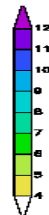
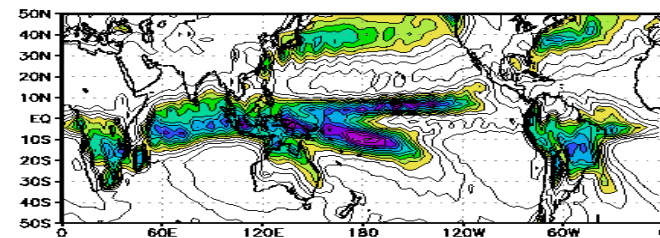
error



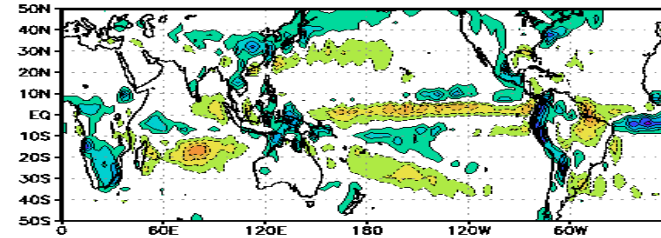
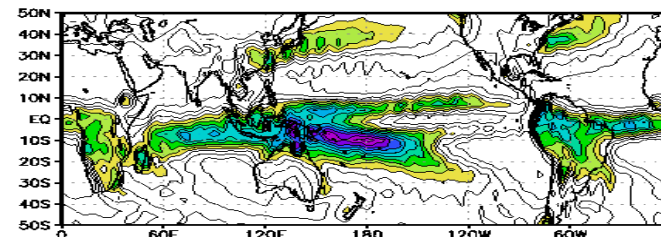
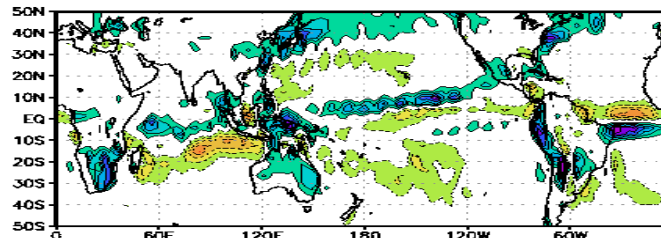
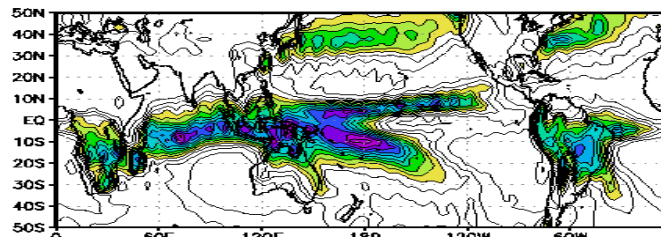
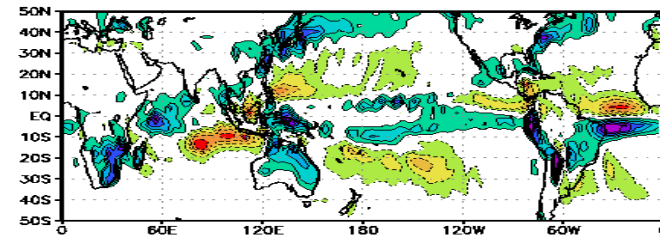
NDJ

FMA

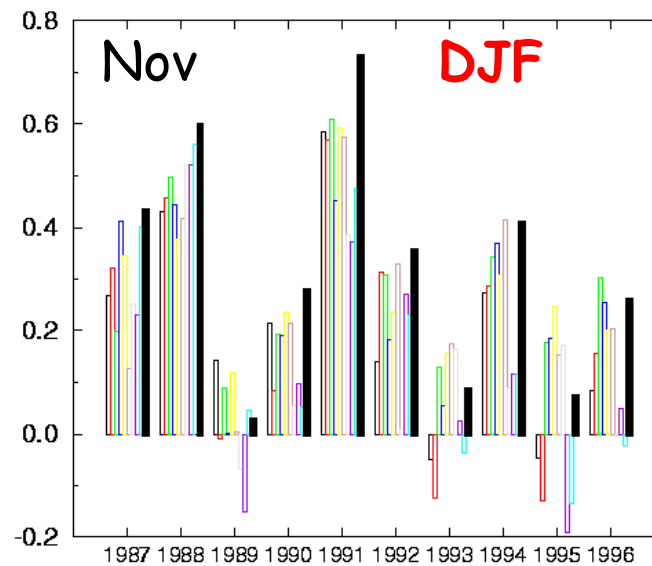
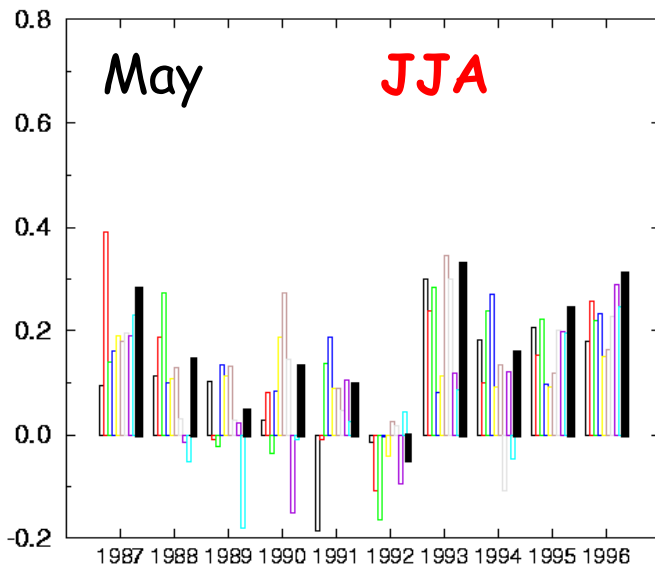
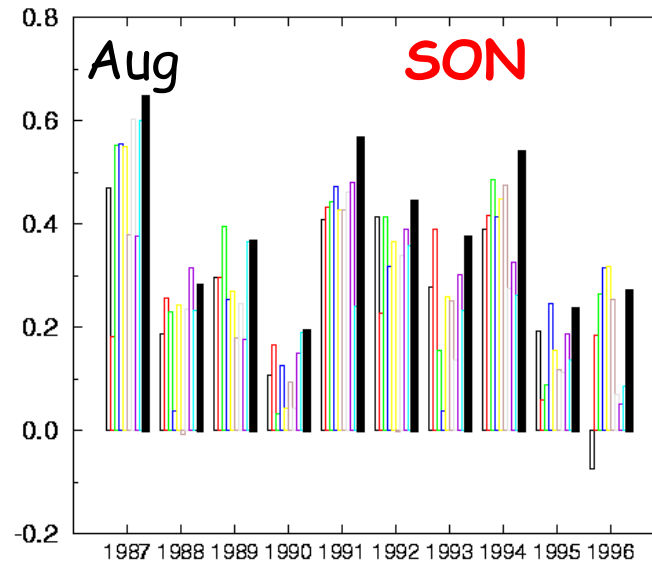
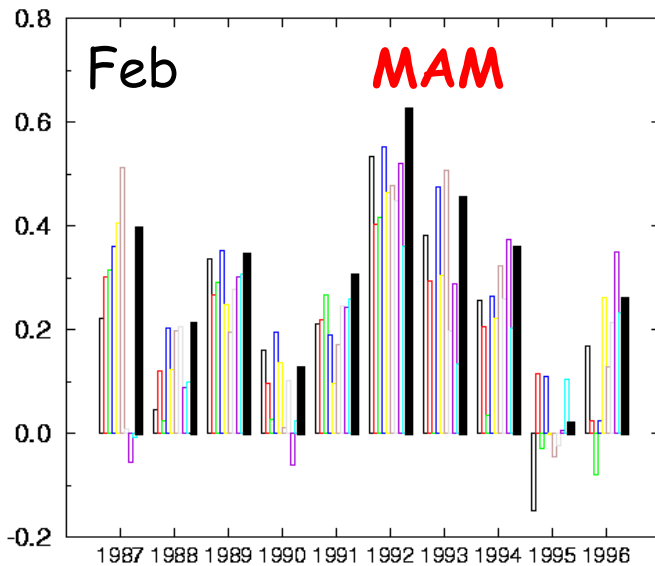
model



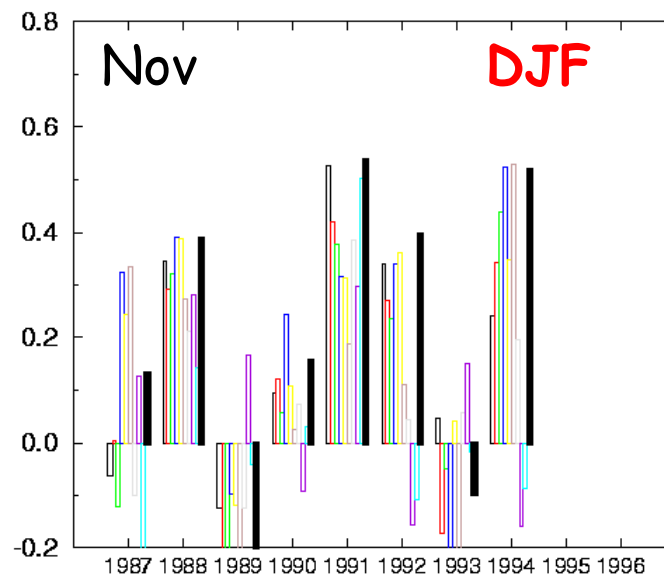
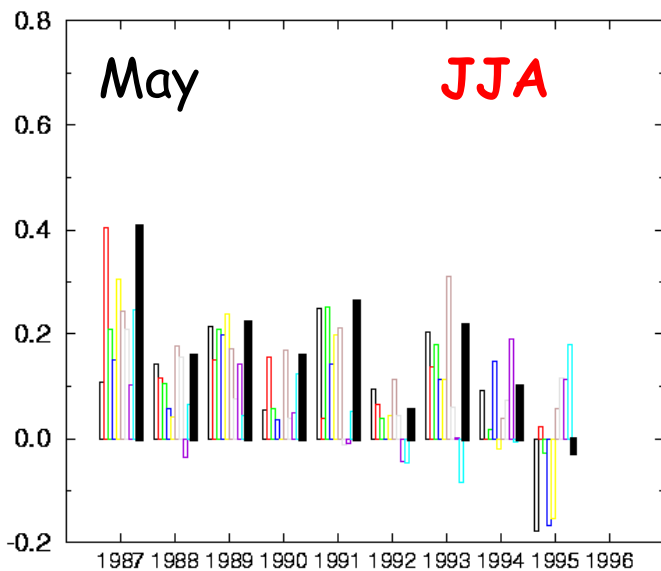
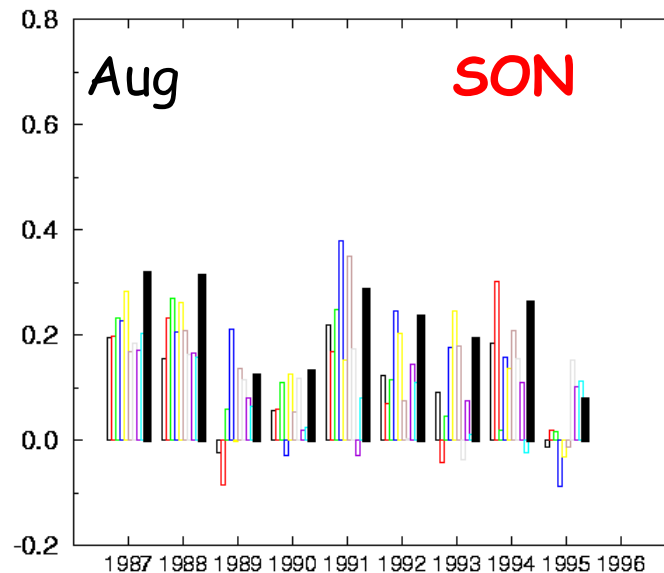
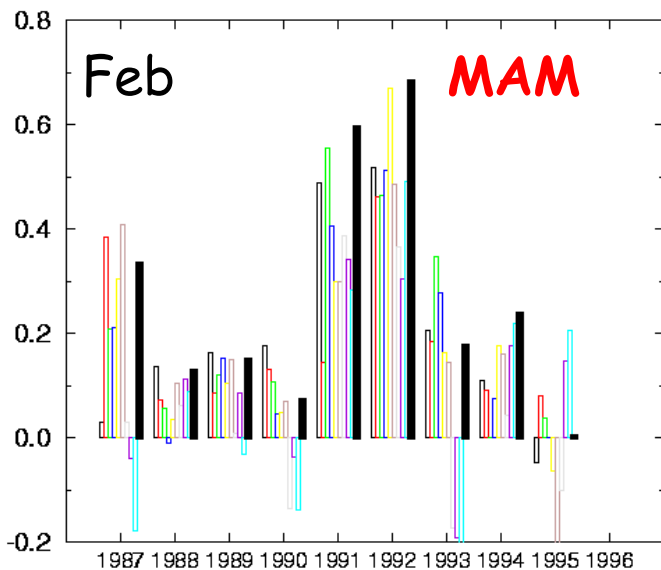
error



## SST



## PRECIP



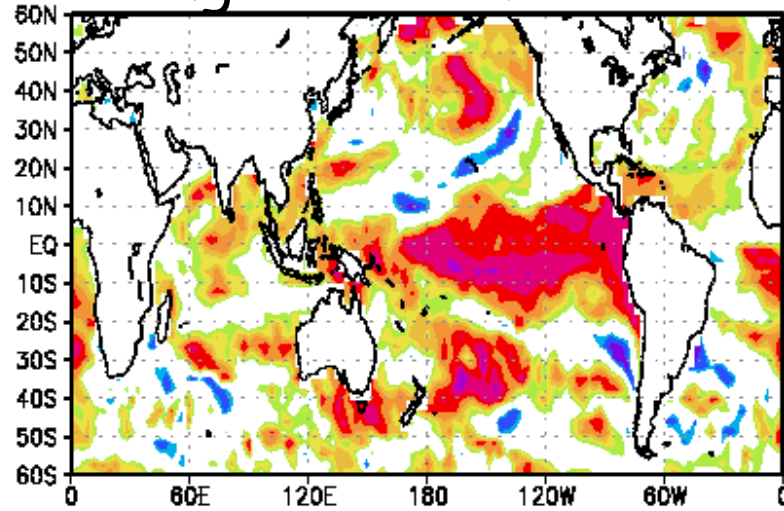
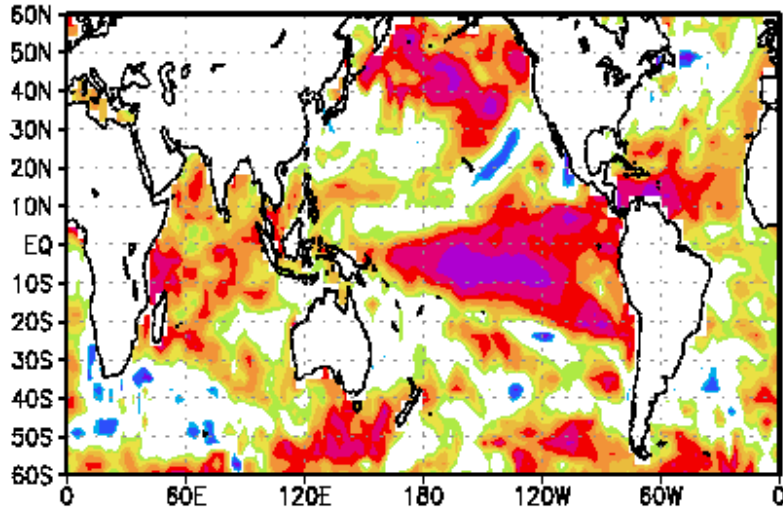
(1987-1996)

Feb

MAM

Aug

SON

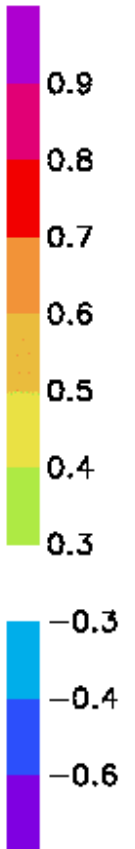
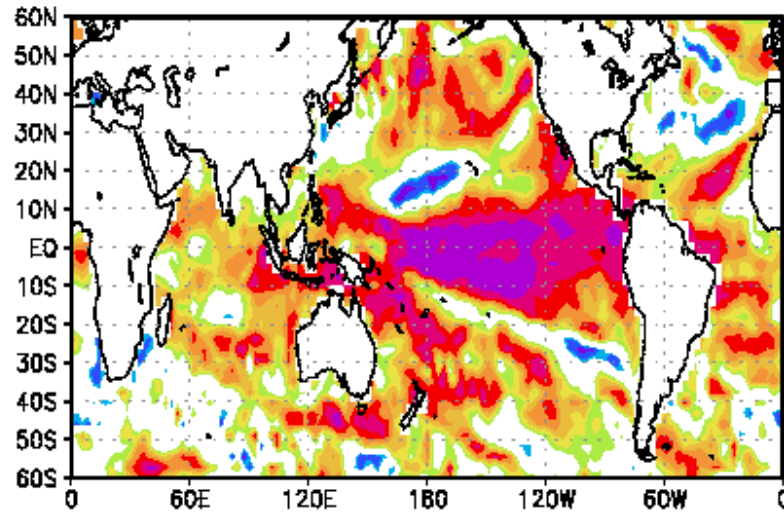
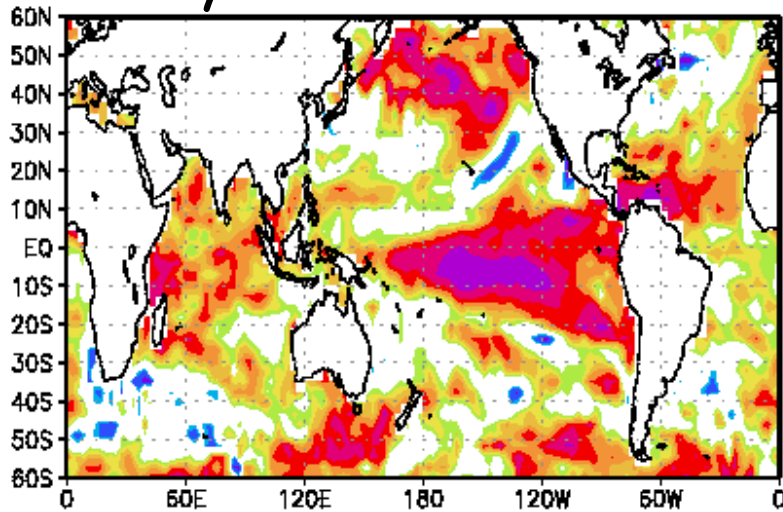


May

JJA

Nov

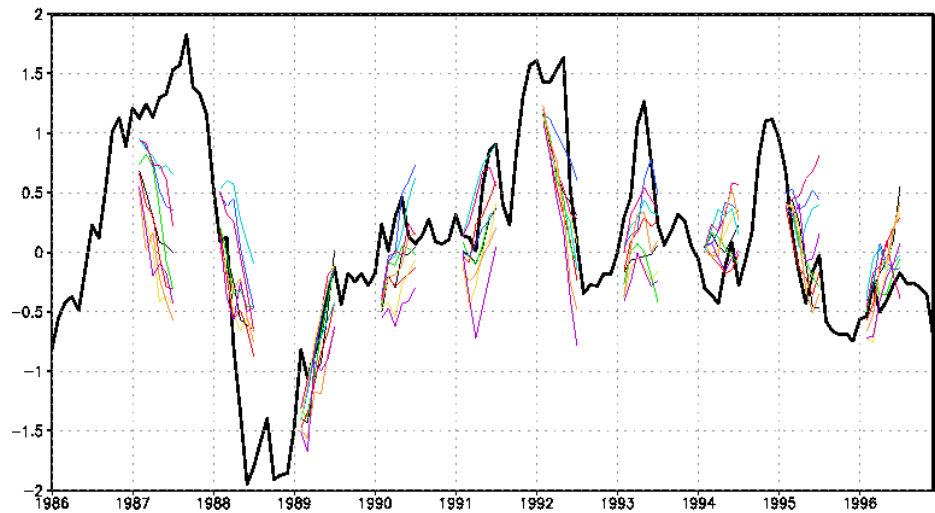
DJF



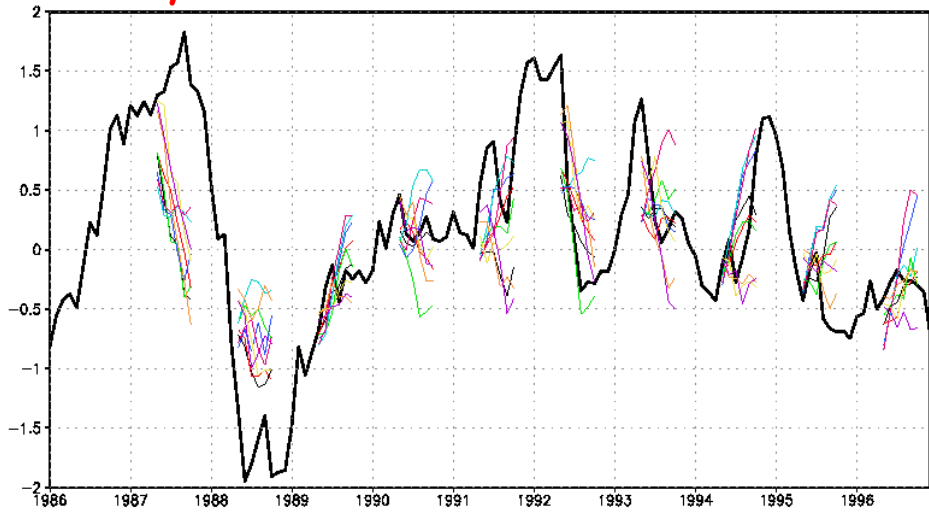
# HINDCASTS

# NINO-3 SSTA

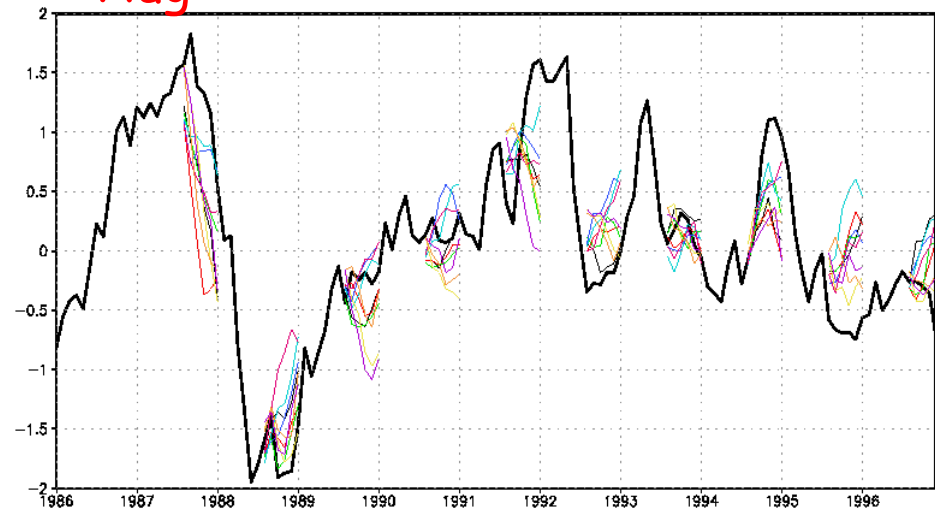
Feb



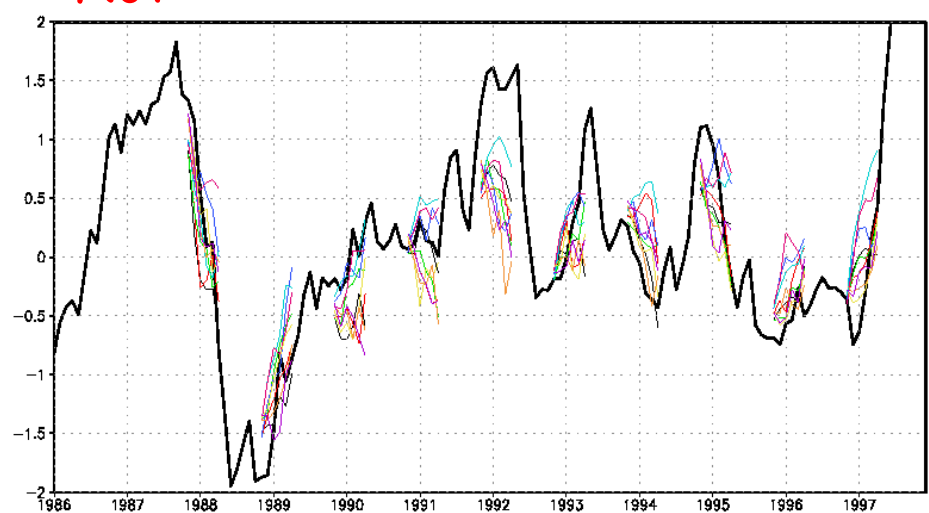
May



Aug



Nov



## current activity:

- **COMPLETE THE HINDCASTS (1998-2001)**  
4.5 day per year → 18 days
- **EVALUATION OF THE HINDCASTS**
- **TRANSFER THE DATA TO MARS**  
1.5 day per year → 20 days (1989-2001)

## future plan:

sensitivity of the hindcasts to the horizontal resolution of the model atmospheric component