

ANALYSIS OF FUTURE CLIMATE CHANGE PROJECTIONS FOR THE ITALIAN ALPINE REGION FROM THE IPCC AR4

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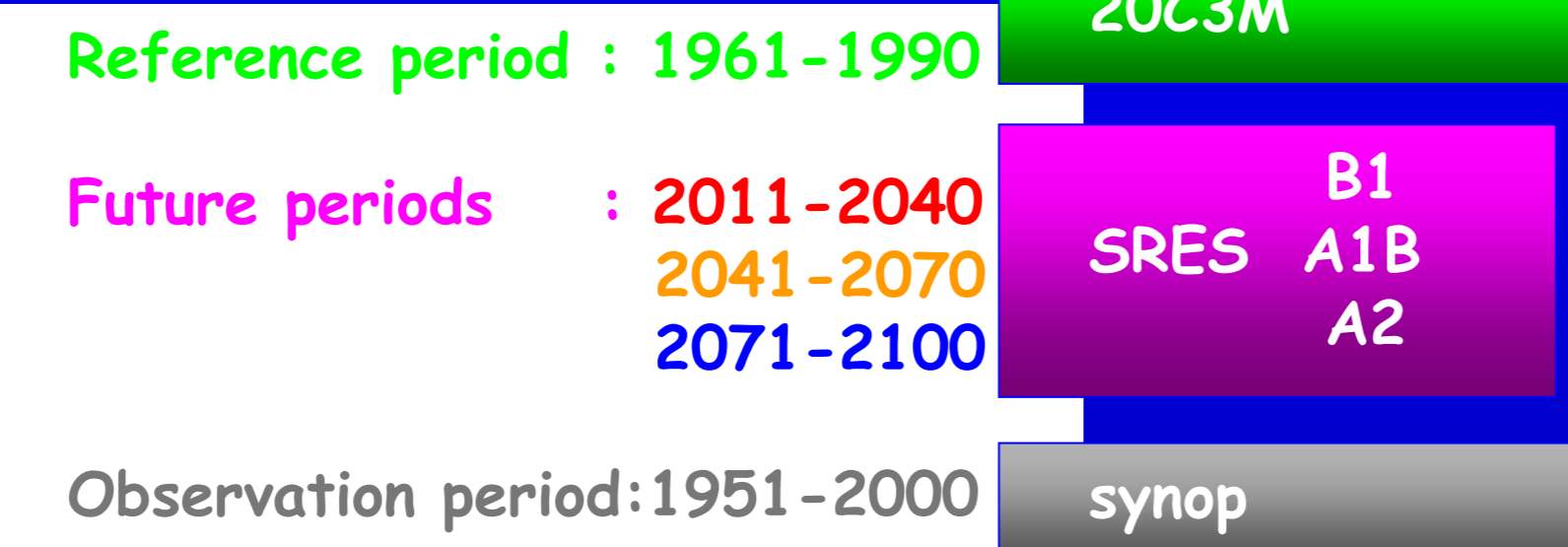
How the latest model simulations estimate the future climate change over Italian Alpine Region?

A particular attention to the Alpine Region, the most important water resource in Italy.

Models:

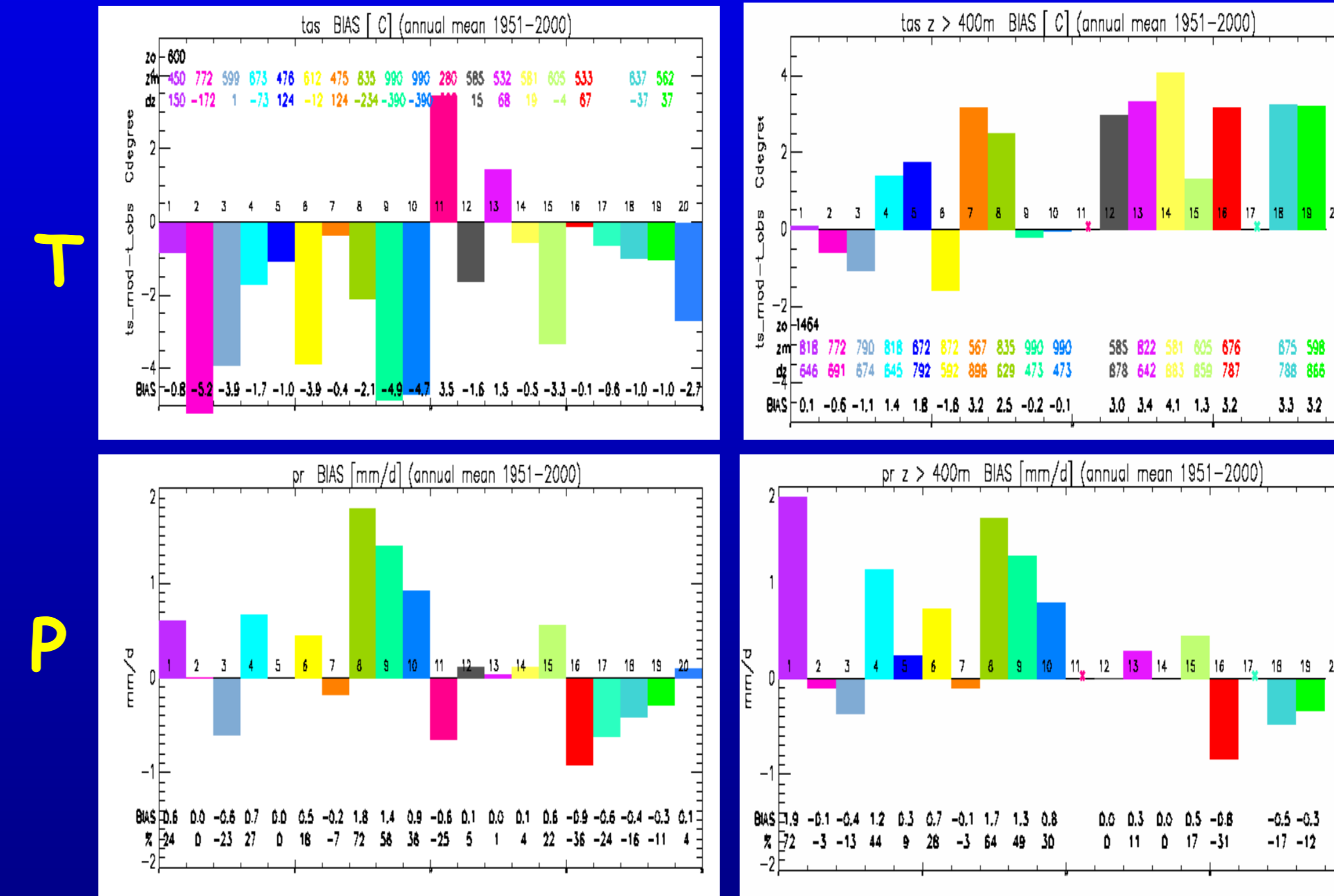
- 1 BCCR-CM2.0
- 2 CGCM3.1(T47)
- 3 CGCM3.1(T63)
- 4 CNRM-CM3
- 5 CSIRO-MK3.0
- 6 GFDL-CM2.0
- 7 GFDL-CM2.1
- 8 GISS-AOM
- 9 GISS-EH
- 10 GISS-ER
- 11 INM-CM3.0
- 12 IPSL-CM4
- 13 MIROC3.2 hires
- 14 MIROC3.2 medres
- 15 ECHAM5
- 16 ECHAM5/MPI-OM
- 17 MRI-CGCM2.3.2
- 18 CCSM3
- 19 PCM
- 20 UKMO-HadCM

1. Data set



2. BIAS index as measure of model performances

$$BIAS = \bar{V}_{mod} - \bar{V}_{syn}$$



3. Criteria for Multi-model ensemble means (E(B1), E(A1B), E(A2))

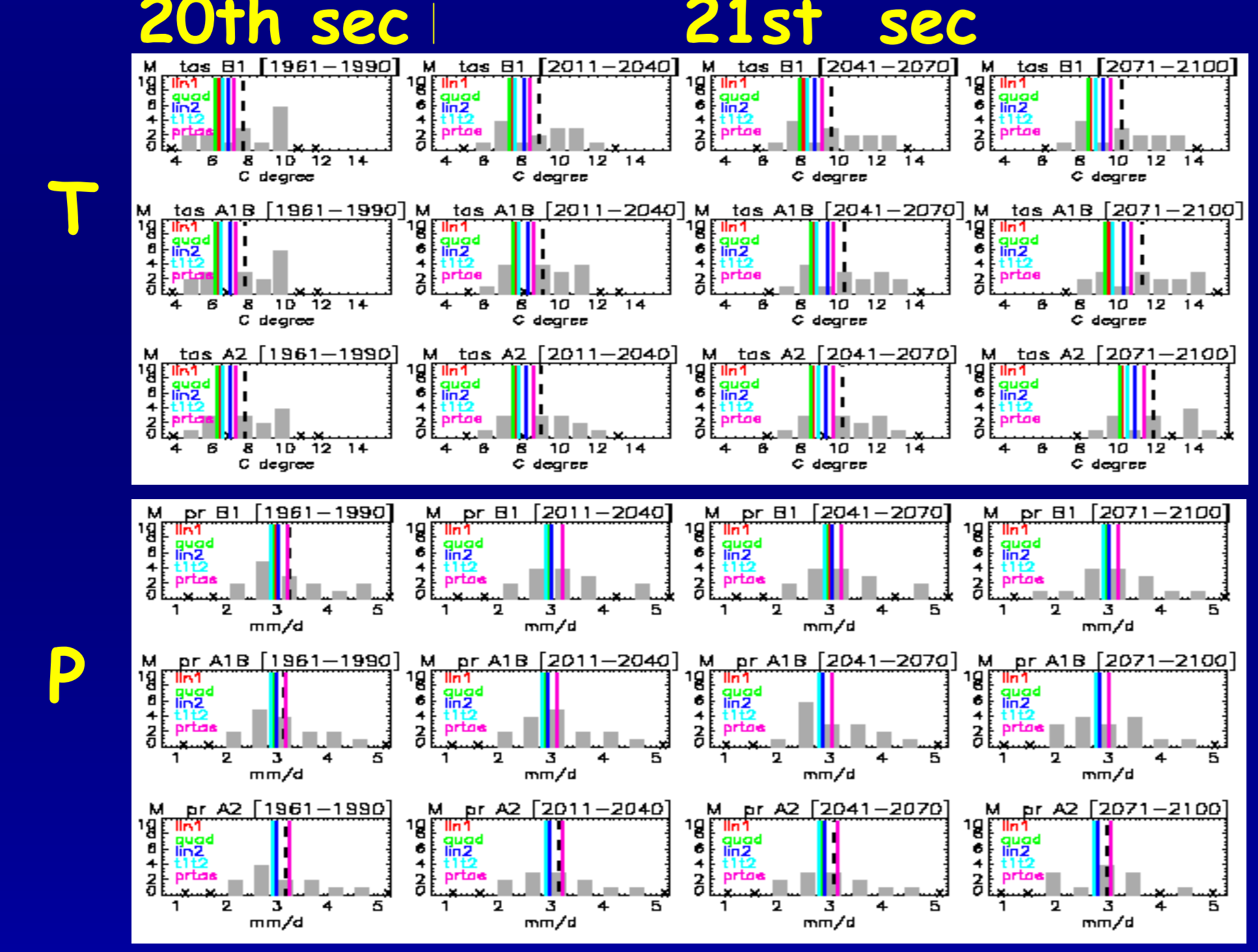
BIAS T [°C]	0	1	2	3
BIAS P [%]	0	10	30	50
W 1) lin1	3	2	1	0
BIAS T [°C]	0	1	2	3
BIAS P [%]	0	10	30	50
W 2) quad	9	4	1	0
BIAS T [°C]	0	1	2	3
BIAS P [%]	0	10	20	40
W 3) lin2	4	3	2	1
BIAS T [°C]	0	1	2	3
BIAS P [%]	0	5	10	20
W 4) fit2	3	2	1	0
BIAS T [°C]	0	1	2	3
BIAS P [%]	0	10	30	50
W 5) prtas	3	2	1	0

W = lin1(T) + lin1(P)

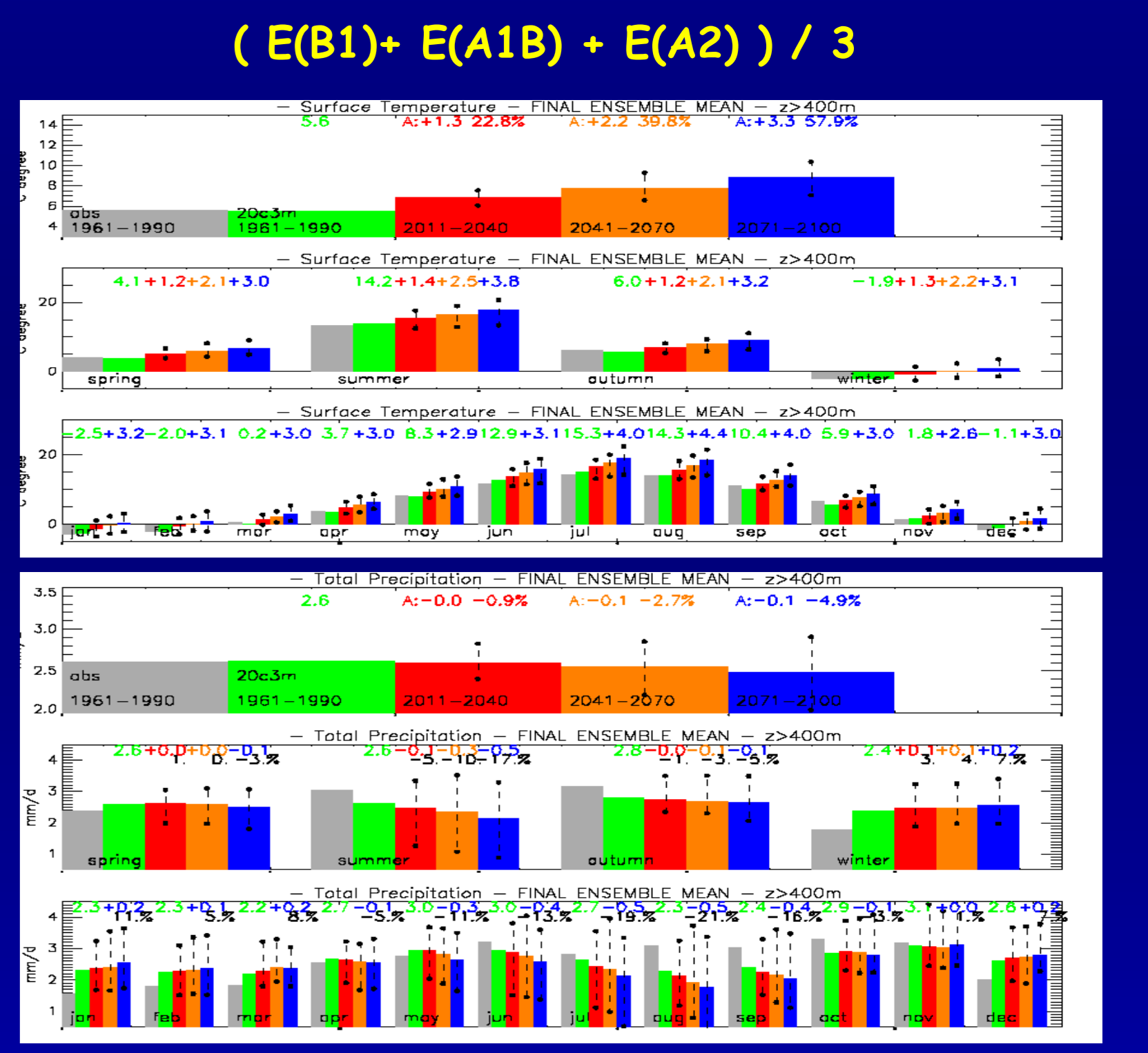
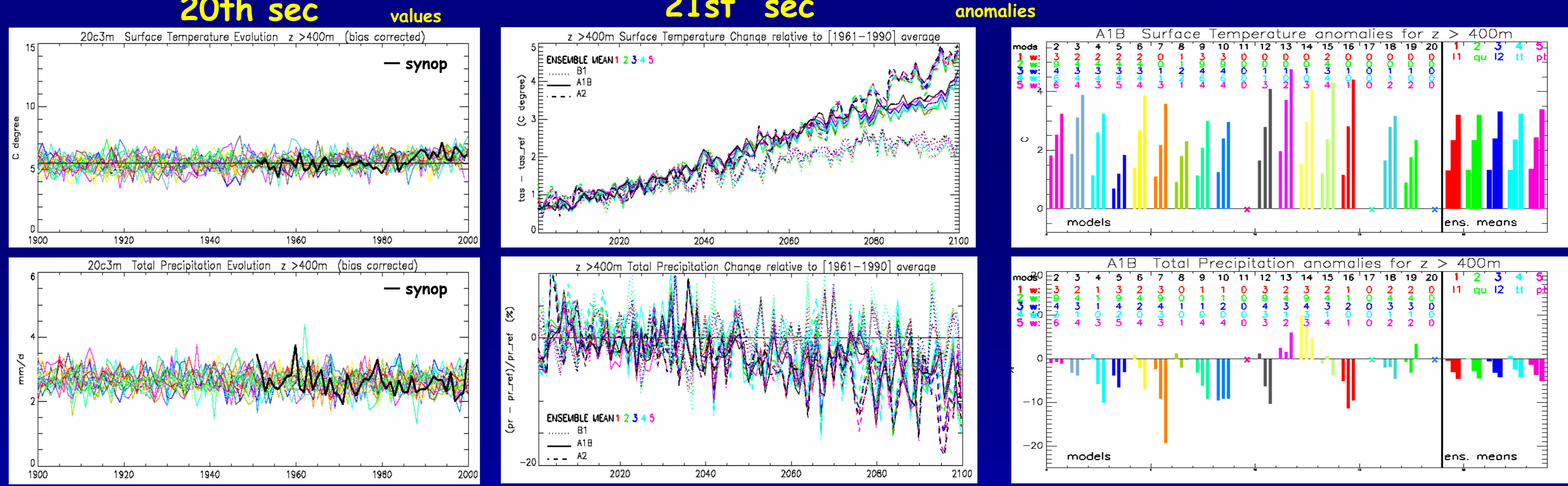
E(B1), E(A1B), E(A2) at:

- Annual scale
- Seasonal scale
- Monthly scale

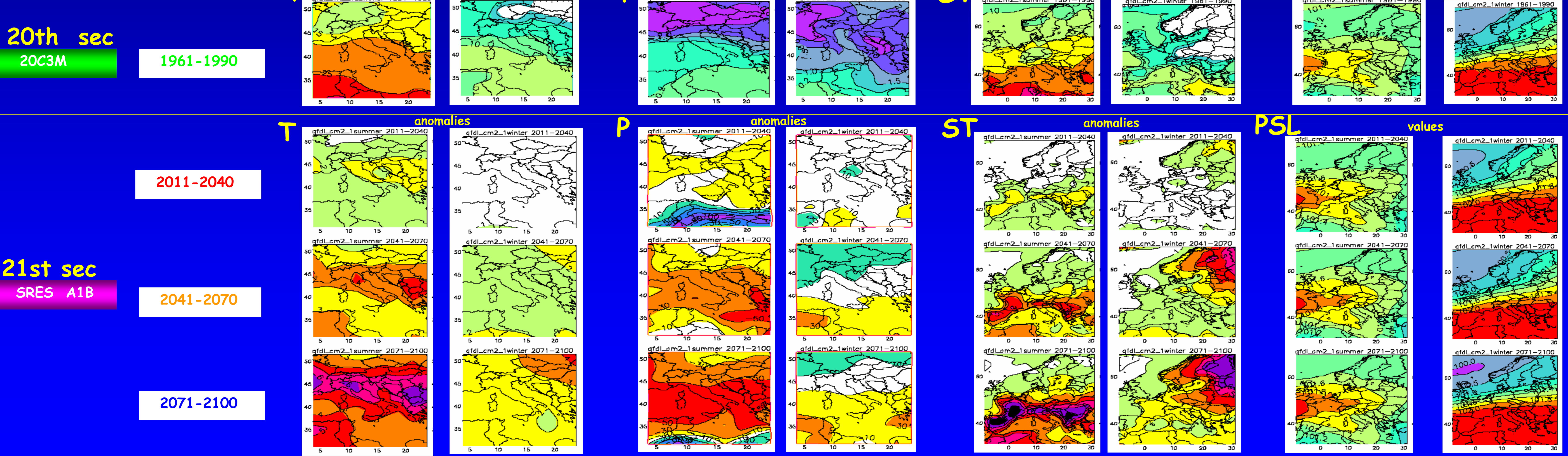
4. Models distribution



5. Multi-model ensemble means



6. Model simulation



CONCLUSIONS

- Annual-mean T is projected to increase by 2-4 degC from 1990 to 2100. Summer T is projected to increase by 5 degC
- Annual-mean P is projected to decrease during the 21st century. Winter P is projected to increase but snowfall and permafrost decrease
- SST is projected to increase of about 2-3 degC
- About PSL: in summer, a stronger anticyclonic regime will imply a reduction of precipitations; in winter, an intensification of pressure gradient in Central Europe could explain the intensification of precipitations in this season
- Emission pathway has greater impact on projected climate change than the ensemble averaging method

ACKNOWLEDGEMENTS

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