

Performance Evaluation of RegCm4 in Simulating Tmax, Tmin over SEACLID/CORDEX SEA Domain

Indonesia Task:

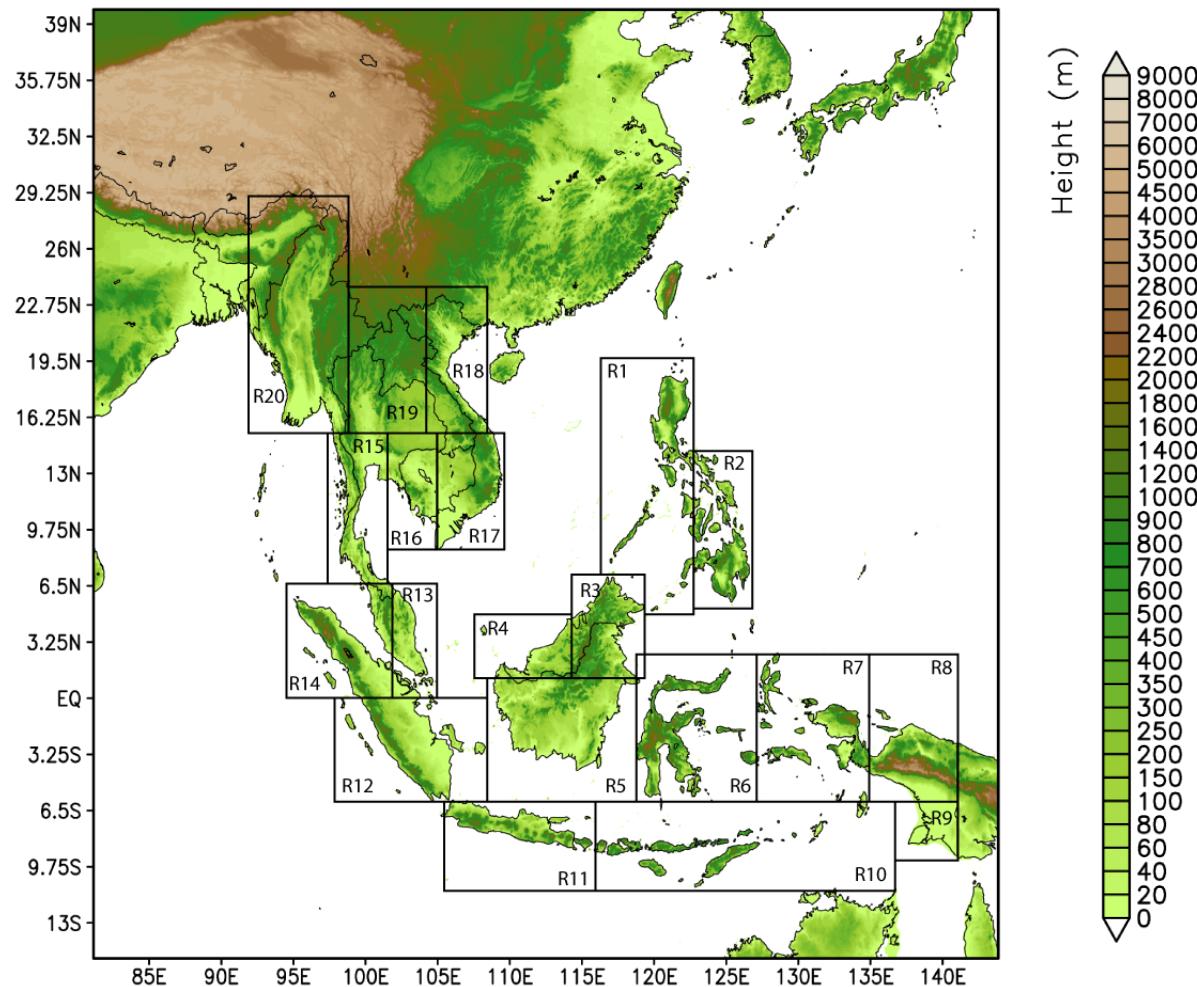
Sensitivity of Different Physics Options in RegCM4 to Maximum and Minimum Temperature in Southeast Asian

E. Aldrian, D. Gunawan,
U. A. Linarka, R. Satyaningsih, D. E. Nuryanto, J. Rizal



PUSAT PENELITIAN DAN PENGEMBANGAN
BADAN METEROLOGI KLIMATOLOGI DAN GEOFISIKA

Model Domain/Sub-Regions

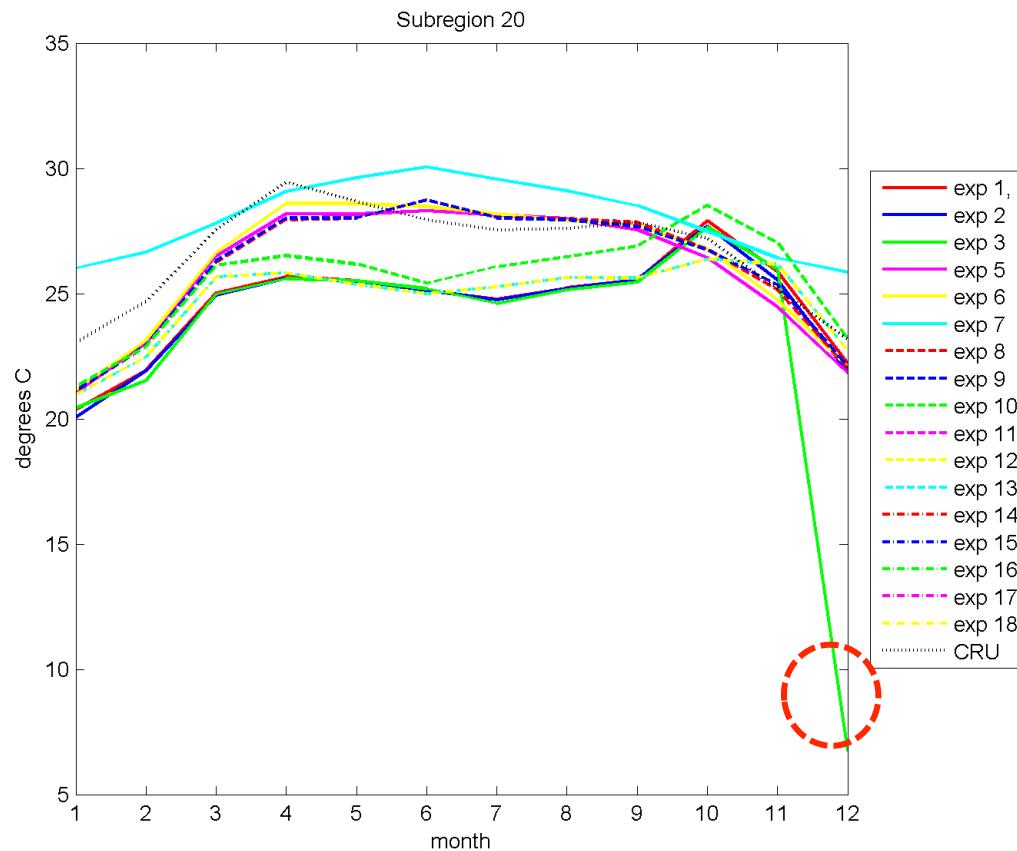


From 20 sub region, 50% covering Indonesia regions

Current Status Report

- ✓ 16 experiments were evaluated from total 18 experiments for 20 sub-regions
 - 1 experiment (exp. 3) ignored due to bad simulation
 - 1 experiment (exp. 4) broken file on 199704
 - 3 experiments (exp. 2, 5, 9) “inconsistent” file ➔ still included in analysis
- ✓ Download date: 14 – 28 May 2014
- ✓ Observation data: CRU 1980-2008 periods
- ✓ Performance Evaluation for TMAX & TMIN:
 - Monthly means
 - Distribution (PDF)
 - Taylor Diagram

Problems



This is the sample of exp.3 simulation, monthly means pattern from Jan – Nov looks fine but suddenly drop at Dec

Experiments Summary

Run #	Country	CPS (icup)	Closure (igcc)	Ocean flux (iocnflux)
Exp01	Indonesia	Grell	Arakawa-Schubert	BAT S1e
Exp02	Indonesia	Grell	Arakawa-Schubert	Zeng (iocnroug=1)
Exp03	Indonesia	Grell	Arakawa-Schubert	Zeng (iocnroug=2)
Exp04	Malaysia	MIT Emanuel	Arakawa-Schubert	BAT S1e
Exp05	Malaysia	MIT Emanuel	Arakawa-Schubert	Zeng (iocnroug=1)
Exp06	Malaysia	MIT Emanuel	Arakawa-Schubert	Zeng (iocnroug=2)
Exp07	Phillipines	Emanuel (land) + Grell (ocean)	Arakawa-Schubert/ Fritsch-Chappell	BAT S1e
Exp08	Phillipines	Emanuel (land) + Grell (ocean)	Arakawa-Schubert/ Fritsch-Chappell	Zeng (iocnroug=1)
Exp09	Phillipines	Emanuel (land) + Grell (ocean)	Arakawa-Schubert/ Fritsch-Chappell	Zeng (iocnroug=2)

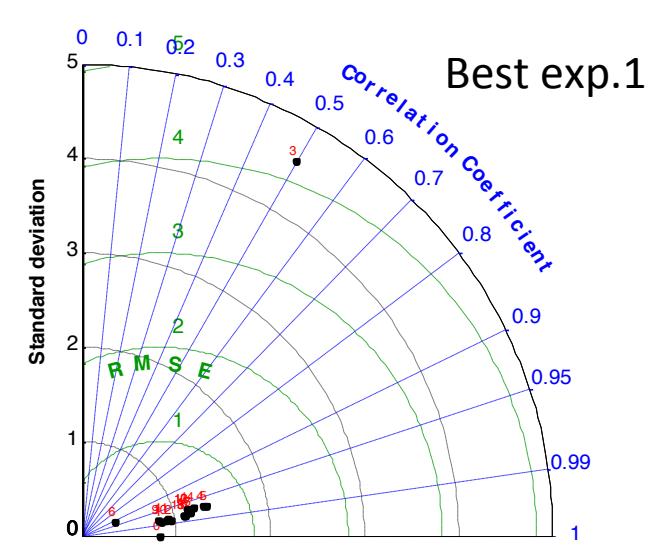
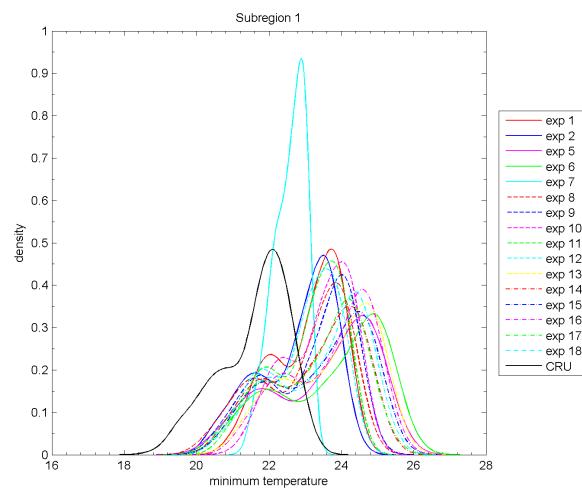
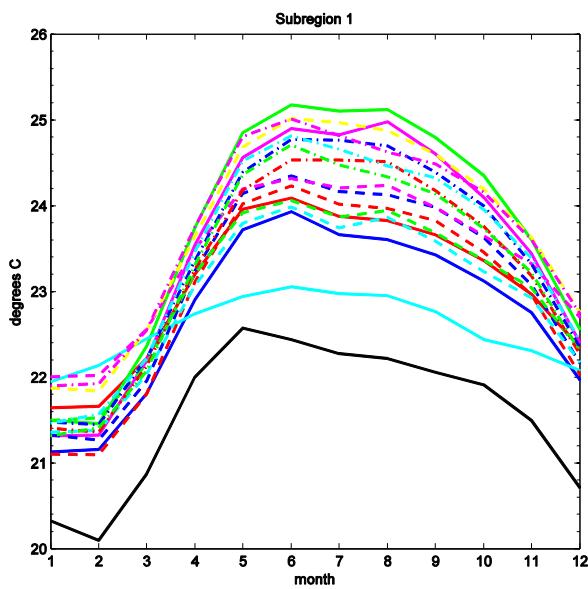
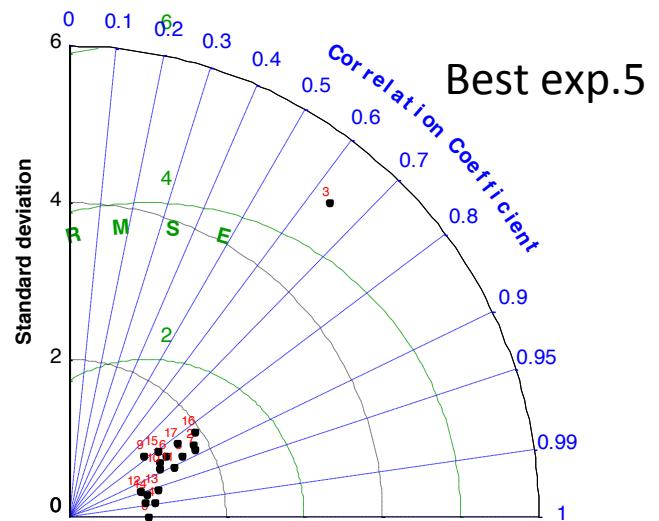
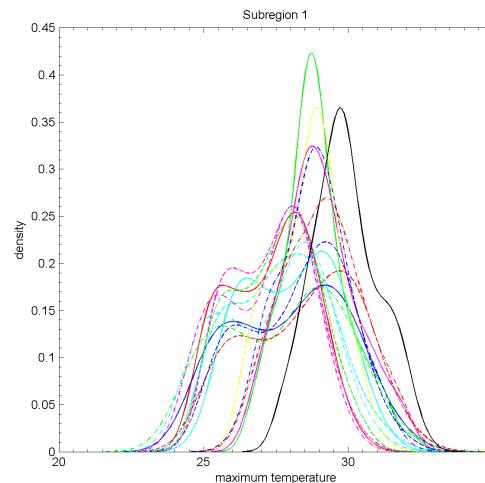
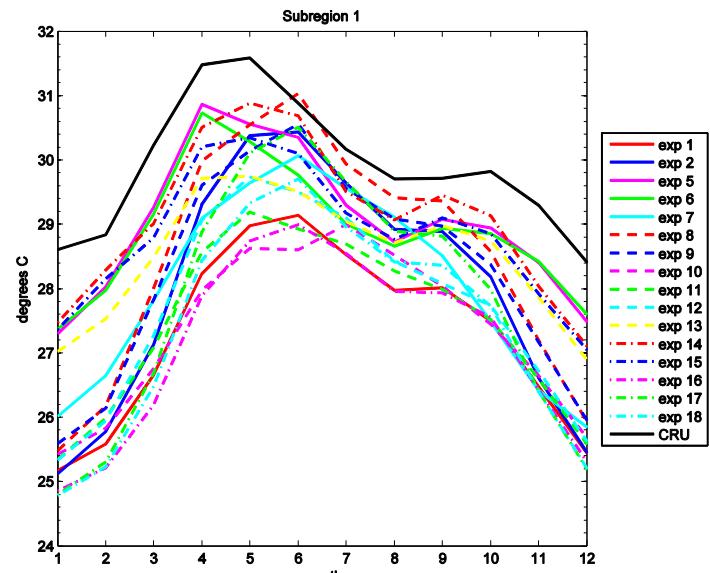
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Blue: ignored

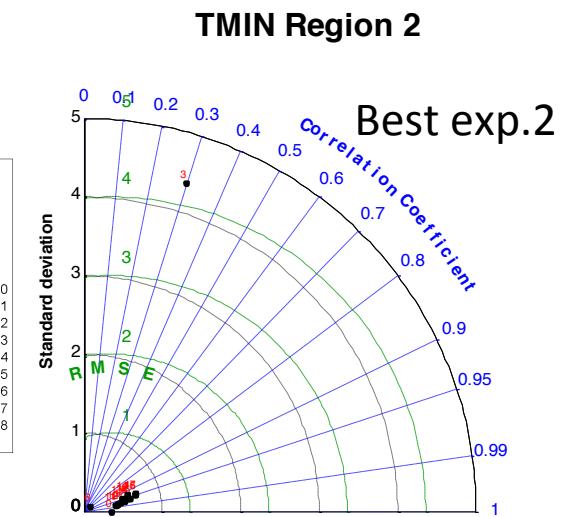
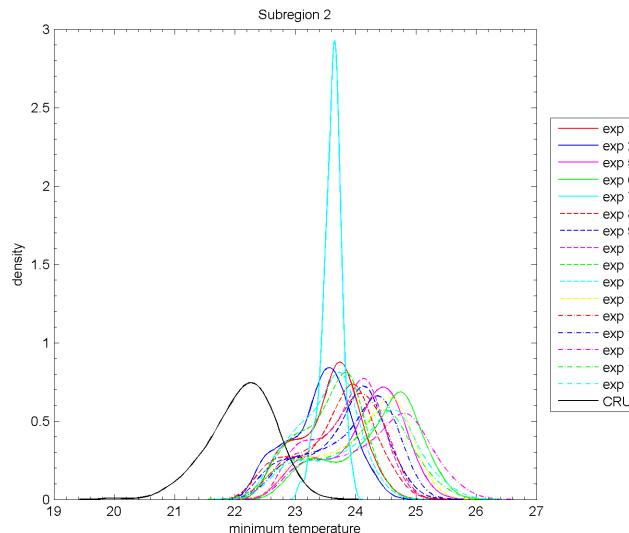
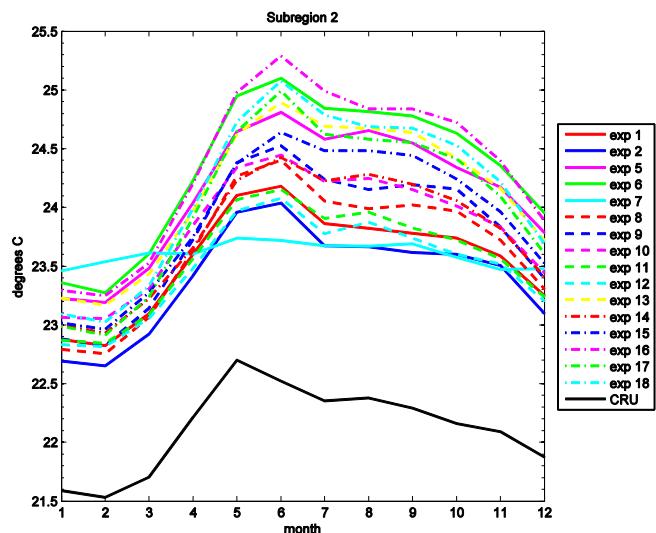
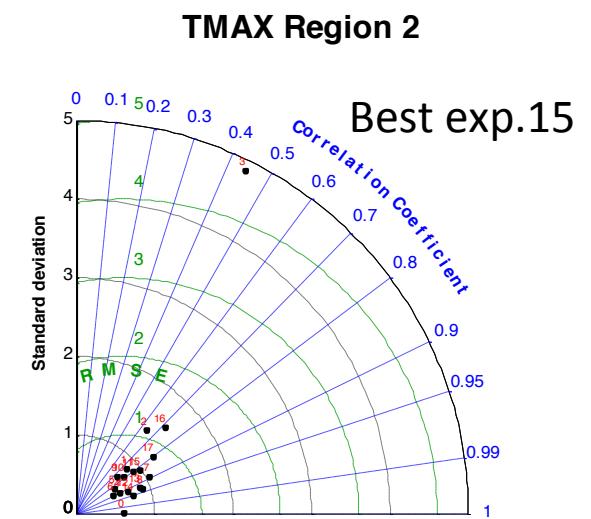
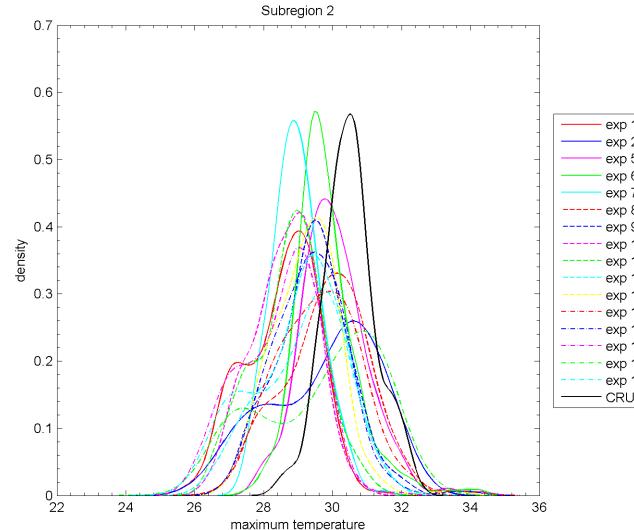
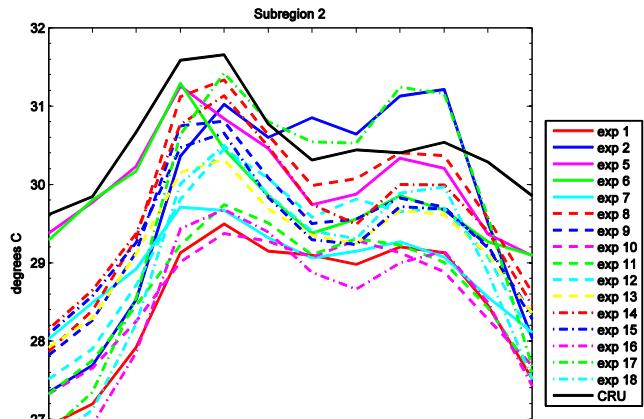
Red : broken file for 199704

Exp10	Thailand	Grell	Fritsch-Chappell	BAT S1e
Exp11	Thailand	Grell	Fritsch-Chappell	Zeng (iocnroug=1)
Exp12	Thailand	Grell	Fritsch-Chappell	Zeng (iocnroug=2)
Exp13	Vietnam	Grell (land) + Emanuel (ocean)	Arakawa-Schubert	BAT S1e
Exp14	Vietnam	Grell (land) + Emanuel (ocean)	Arakawa-Schubert	Zeng (iocnroug=1)
Exp15	Vietnam	Grell (land) + Emanuel (ocean)	Arakawa-Schubert	Zeng (iocnroug=2)
Exp16	Malaysia	Kuo	Arakawa-Schubert	BAT S1e
Exp17	Malaysia	Kuo	Arakawa-Schubert	Zeng (iocnroug=1)
Exp18	Thailand	Kuo	Arakawa-Schubert	Zeng (iocnroug=2)

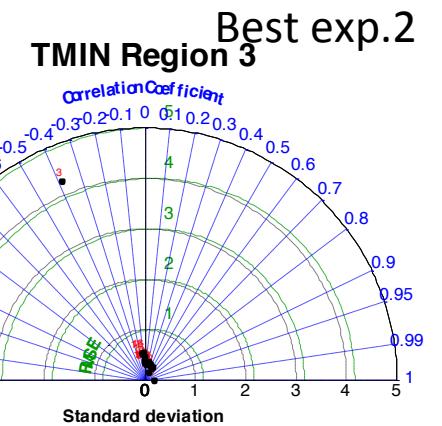
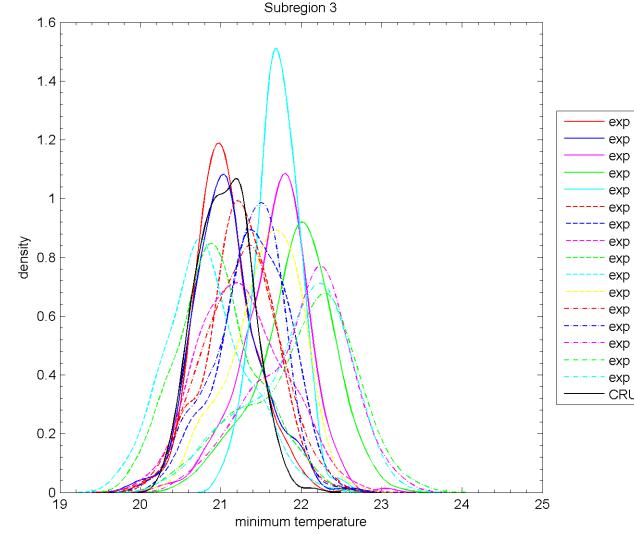
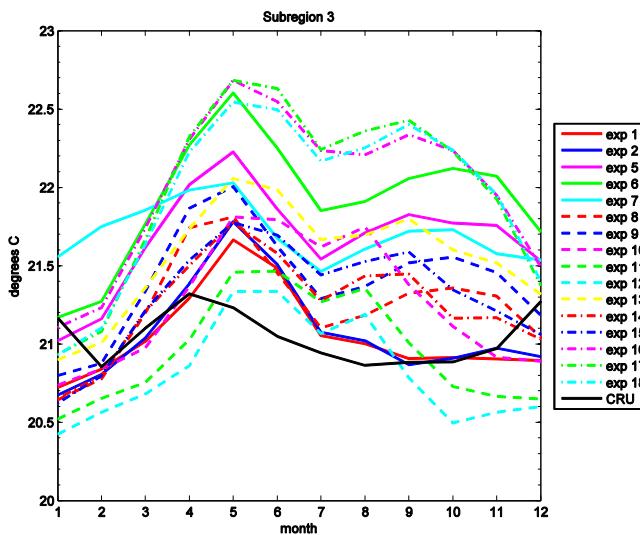
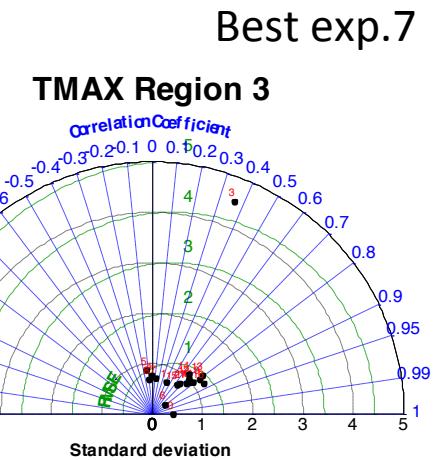
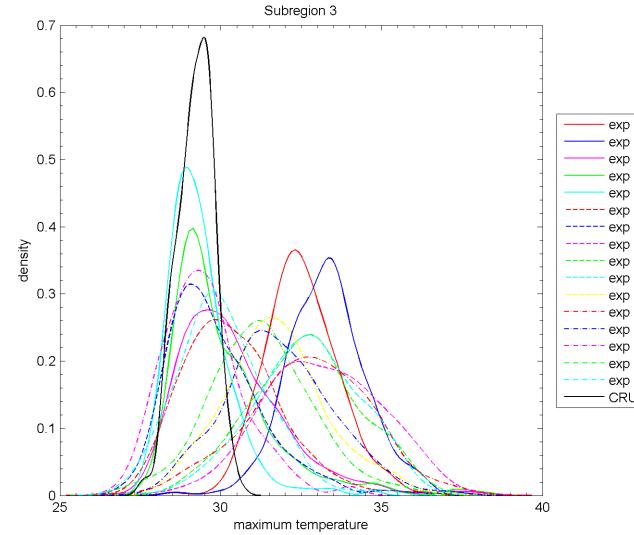
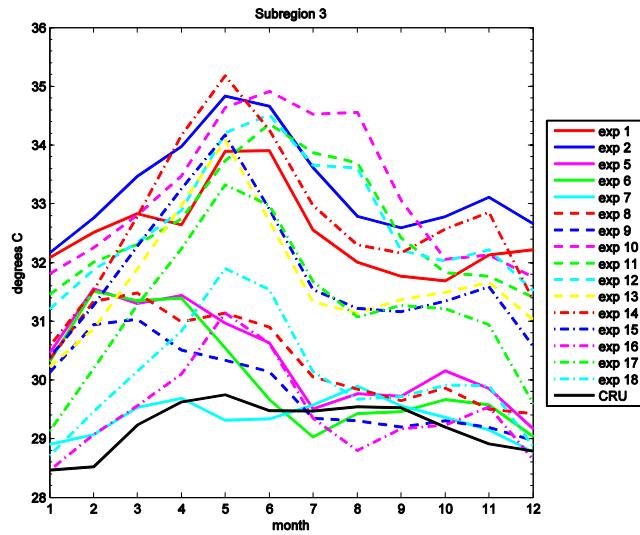
Performance Evaluation Tmax & Tmin for sub-region 1



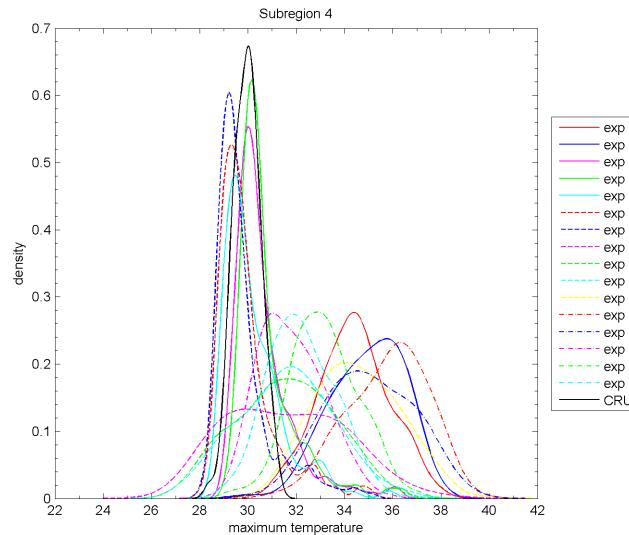
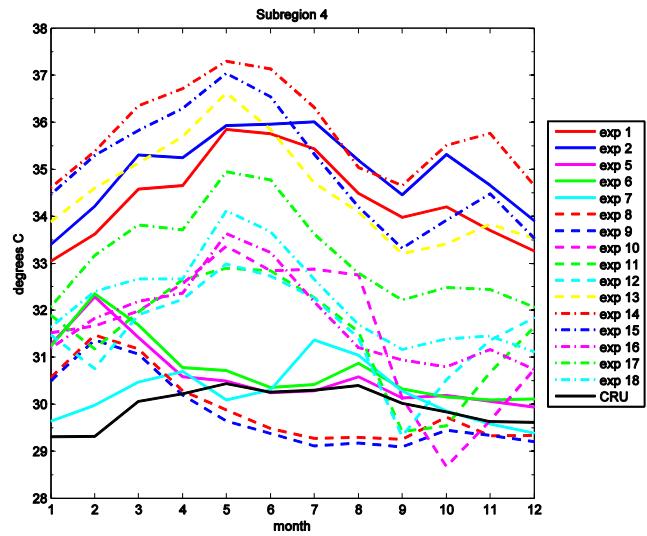
Performance Evaluation Tmax & Tmin for sub-region 2



Performance Evaluation Tmax & Tmin for sub-region 3

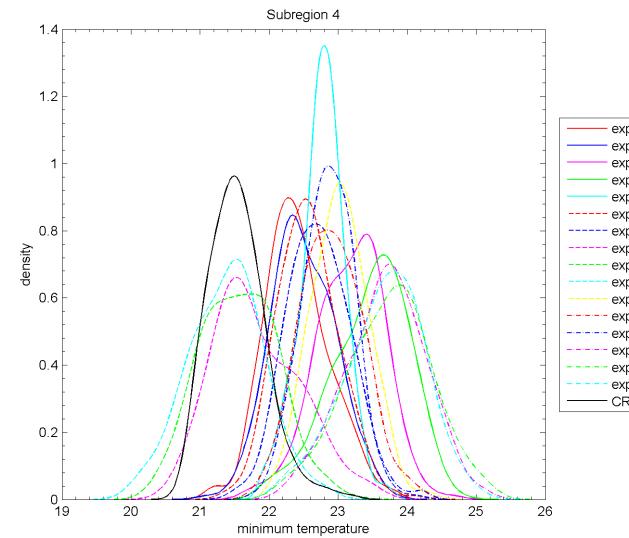
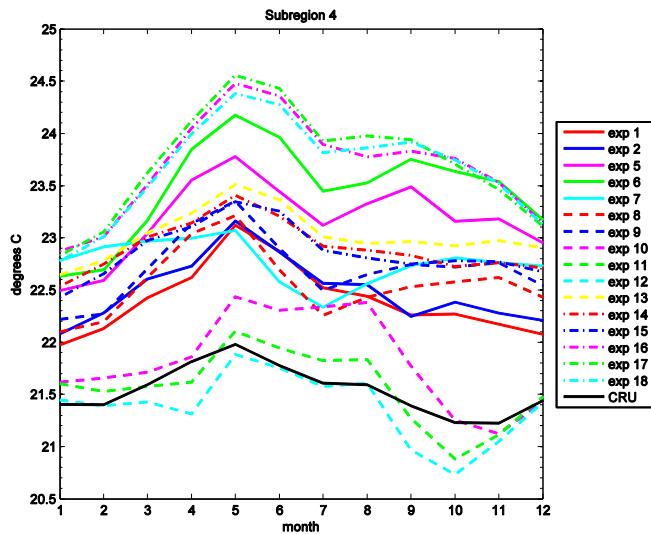
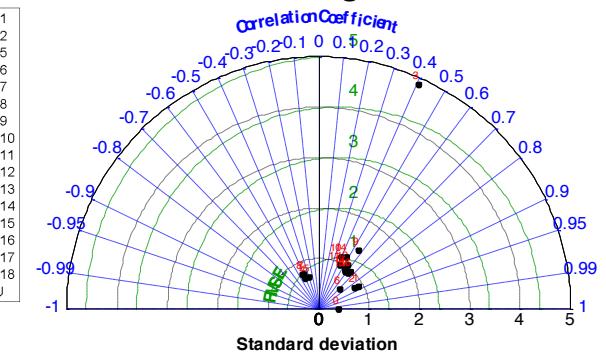


Performance Evaluation Tmax & Tmin for sub-region 4

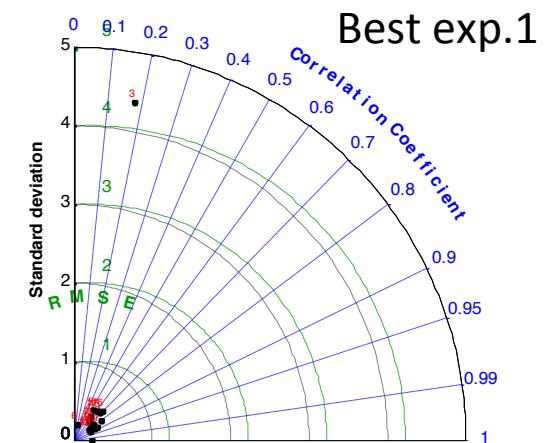


Best exp.1

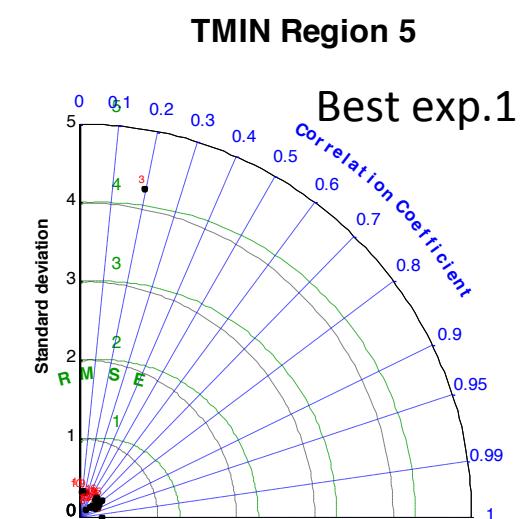
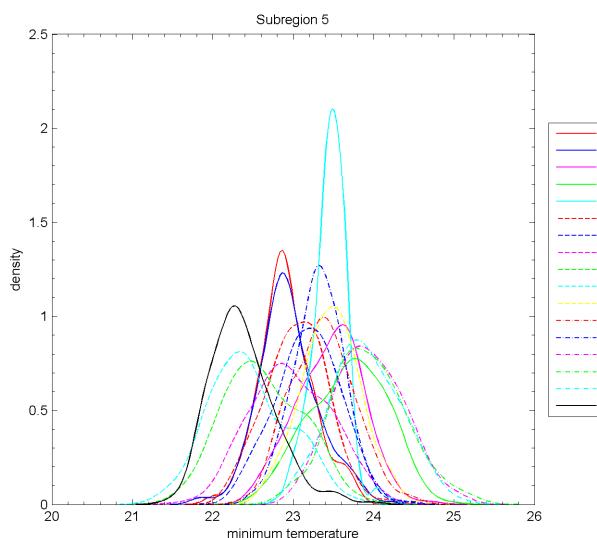
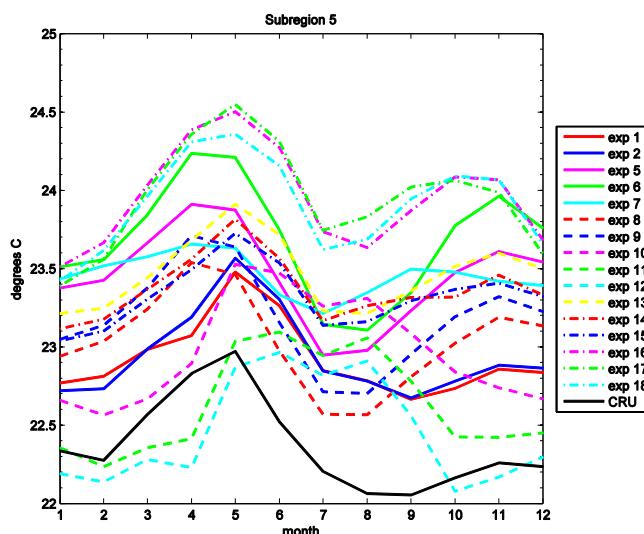
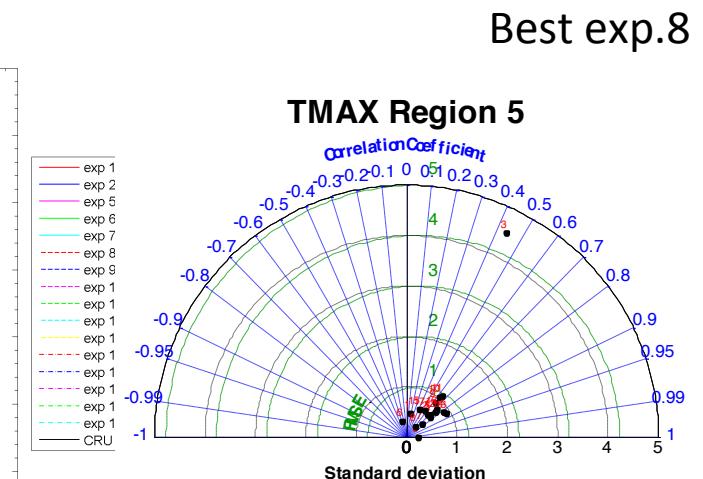
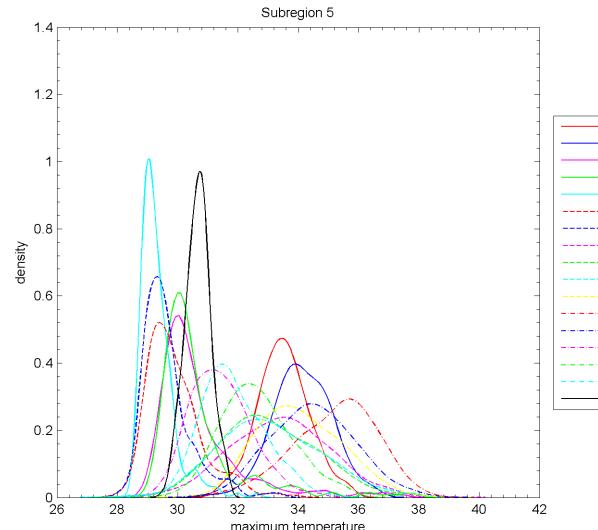
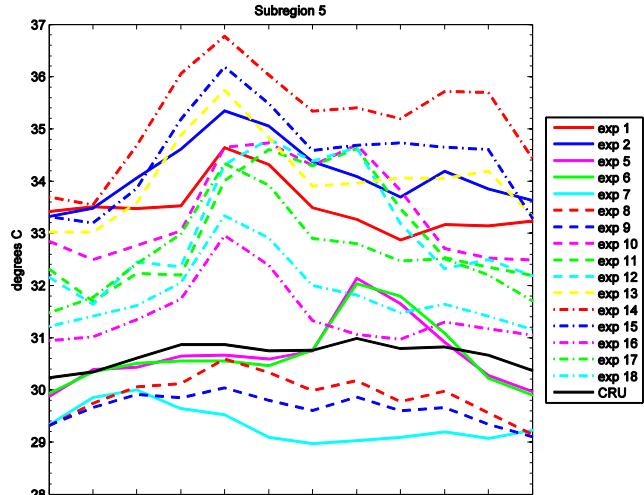
TMAX Region 4



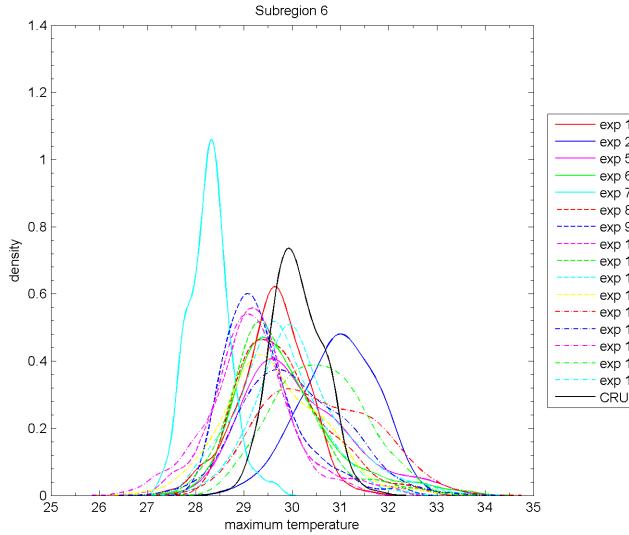
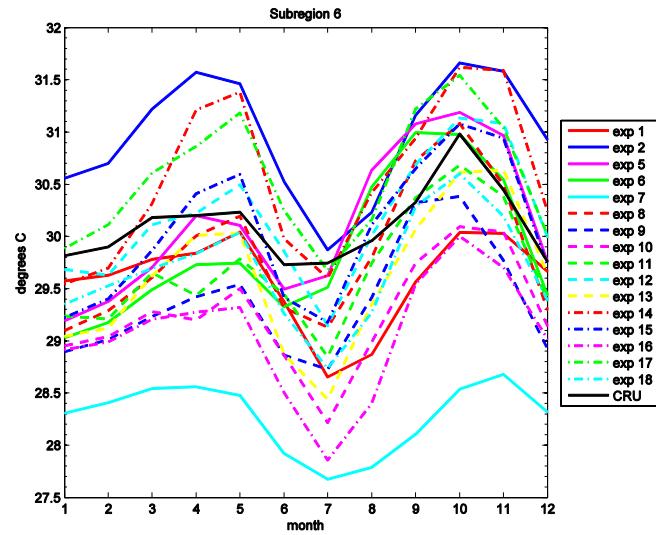
TMIN Region 4



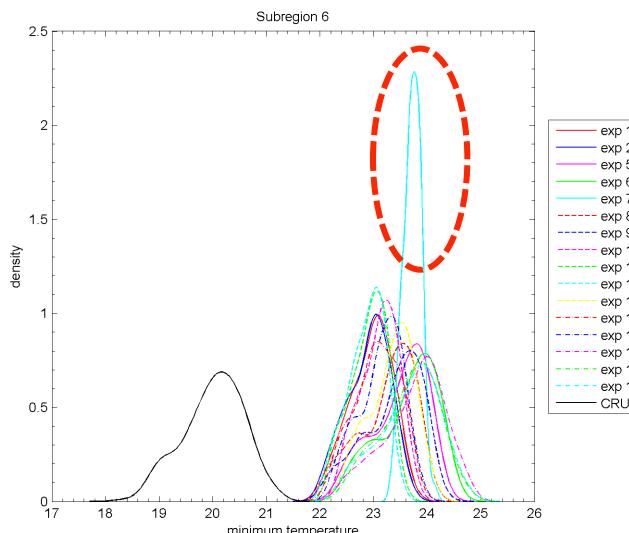
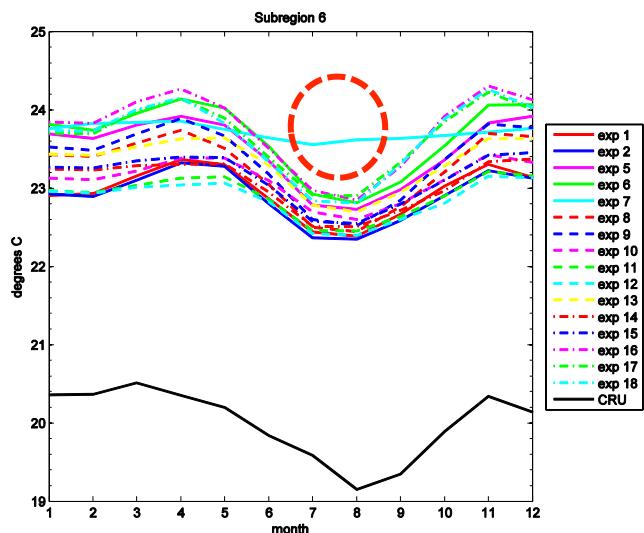
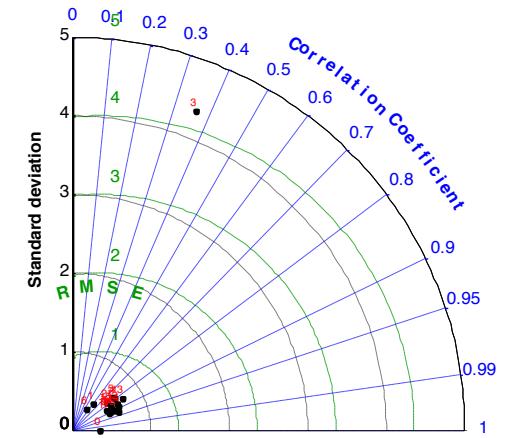
Performance Evaluation Tmax & Tmin for sub-region 5



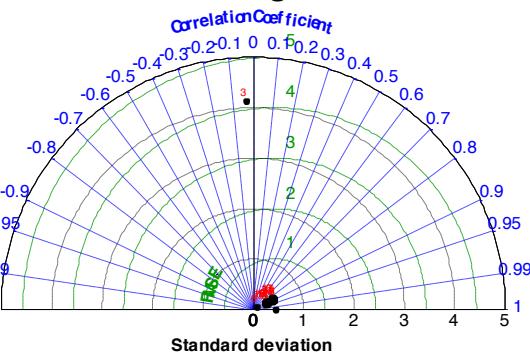
Performance Evaluation Tmax & Tmin for sub-region 6



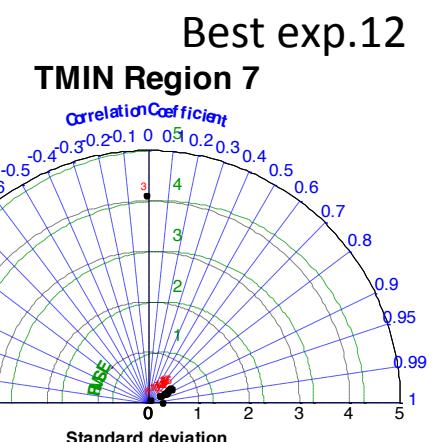
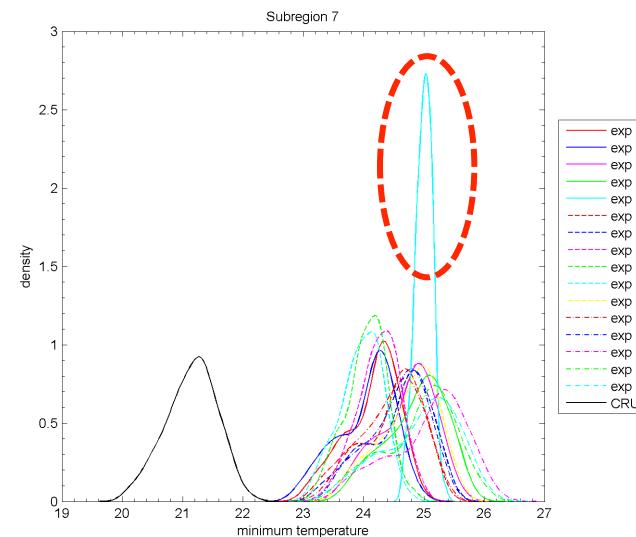
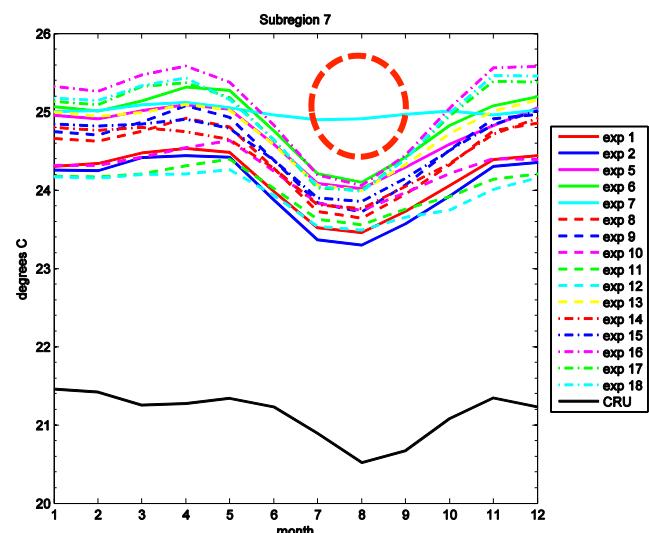
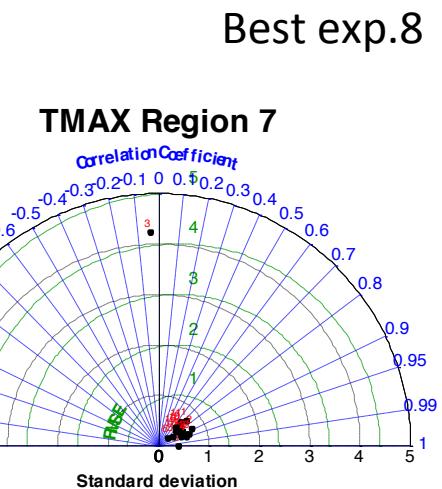
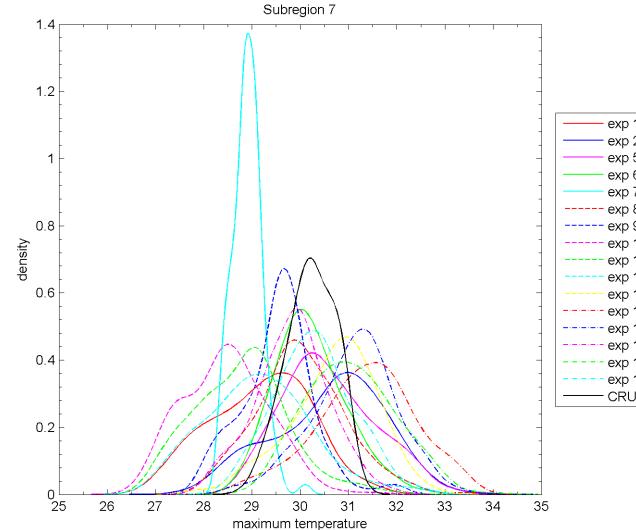
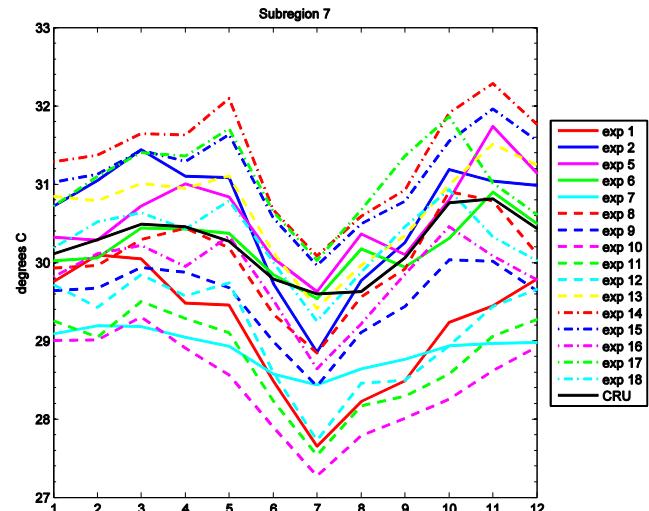
Best exp.18
TMAX Region 6



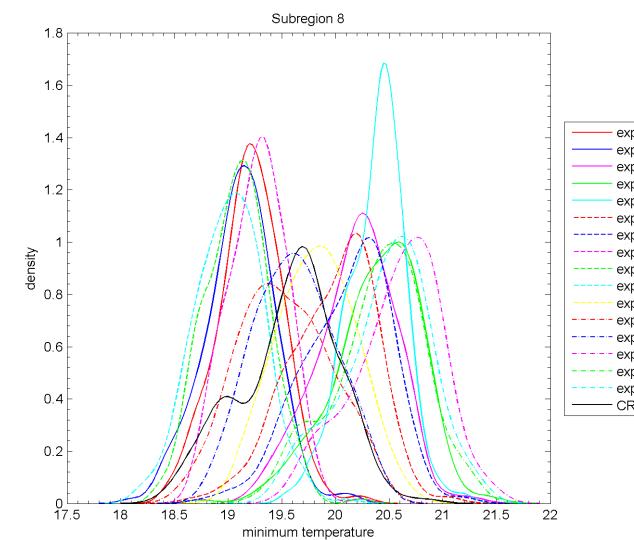
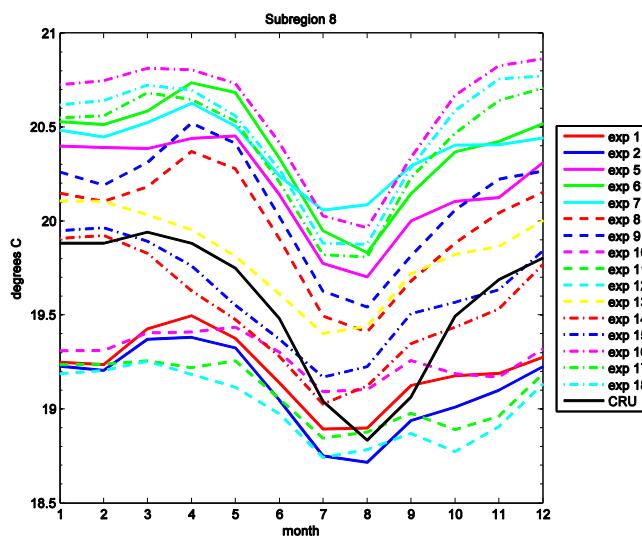
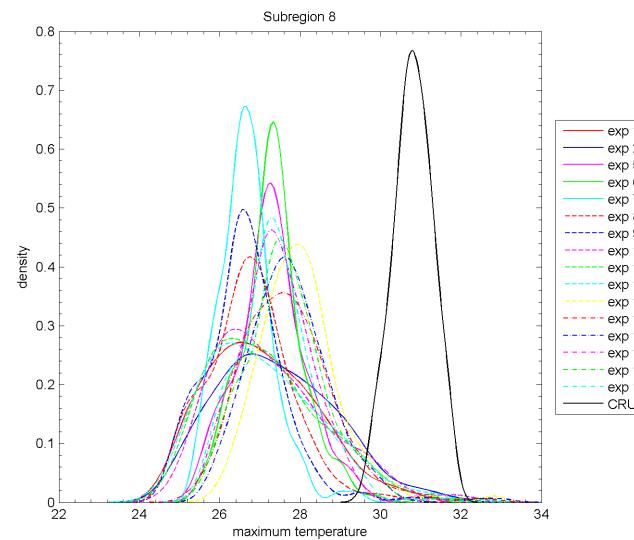
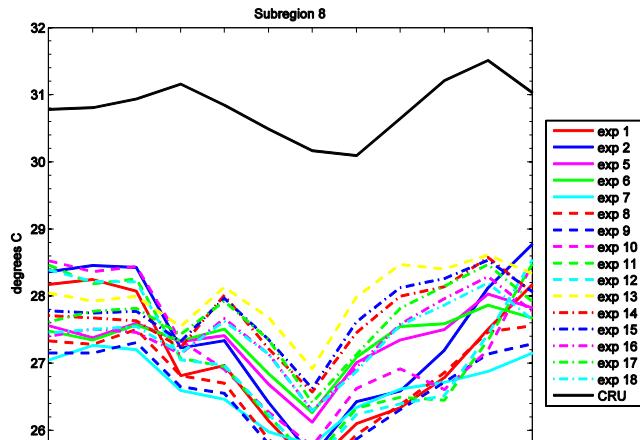
Best exp.5
TMIN Region 6



Performance Evaluation Tmax & Tmin for sub-region 7

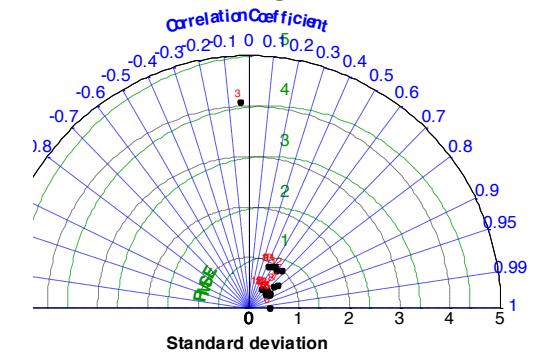


Performance Evaluation Tmax & Tmin for sub-region 8



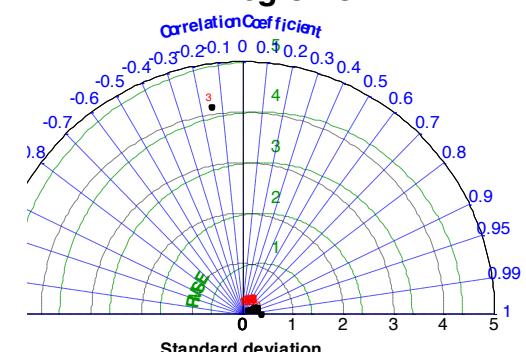
Best exp.17

TMAX Region 8

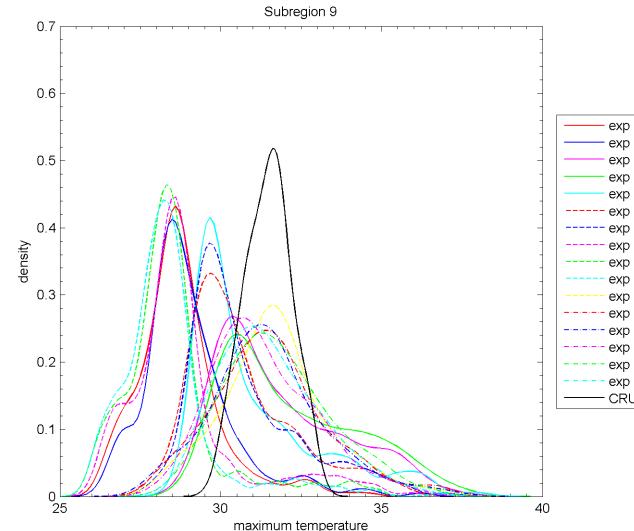
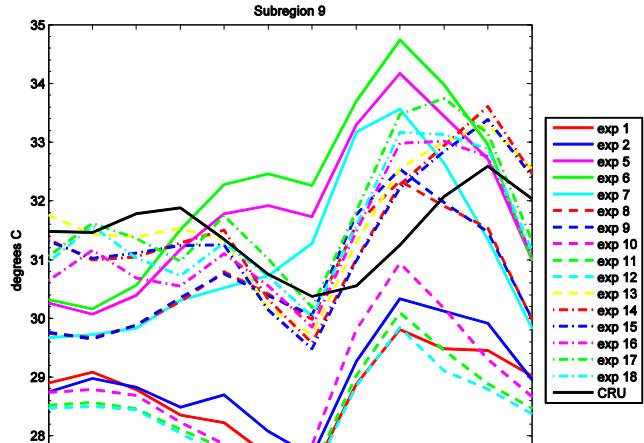


Best exp.5/6

TMIN Region 8

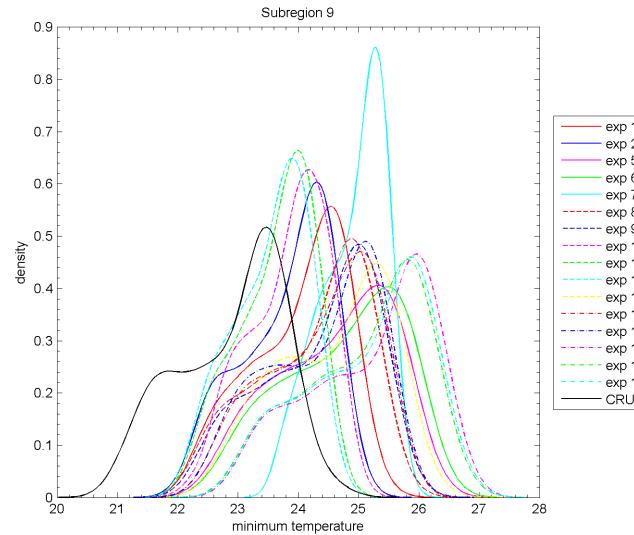
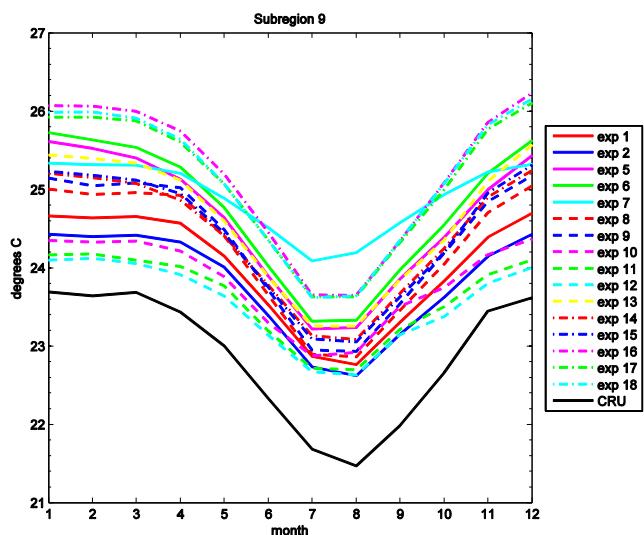
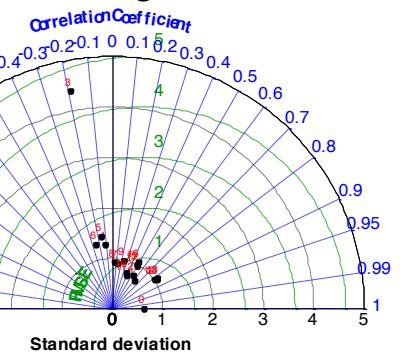


Performance Evaluation Tmax & Tmin for sub-region 9



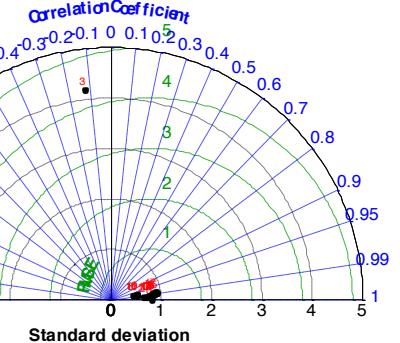
Best exp.15

TMAX Region 9

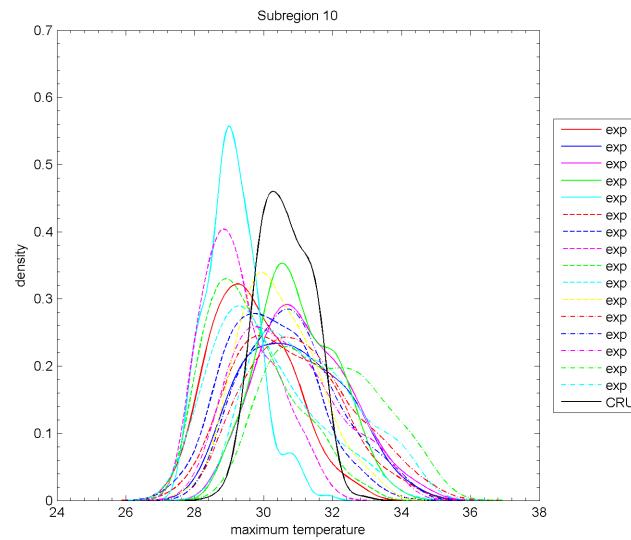
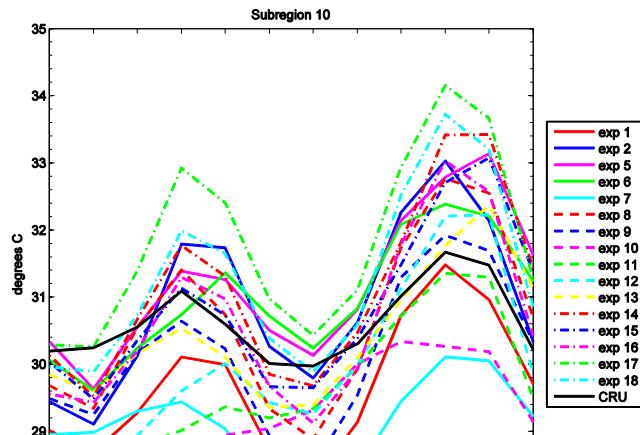


Best exp.12

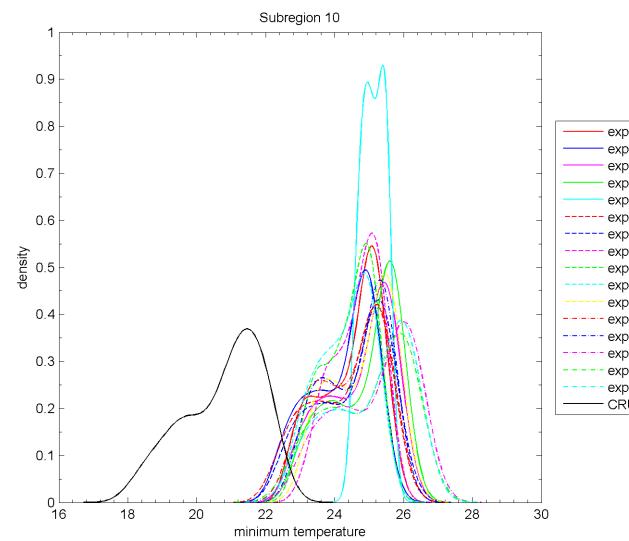
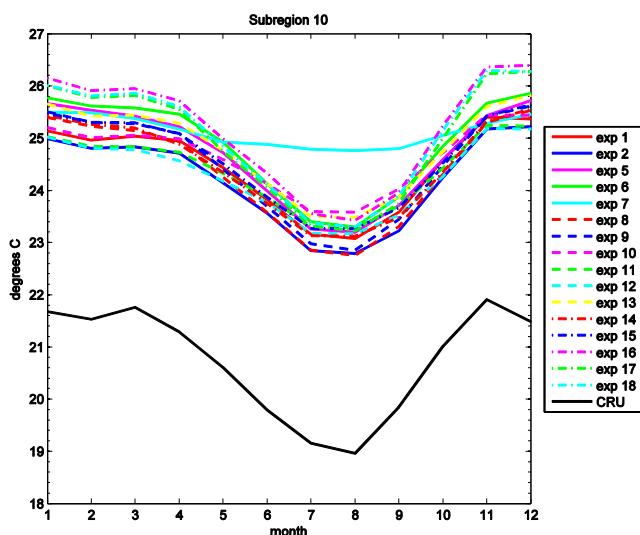
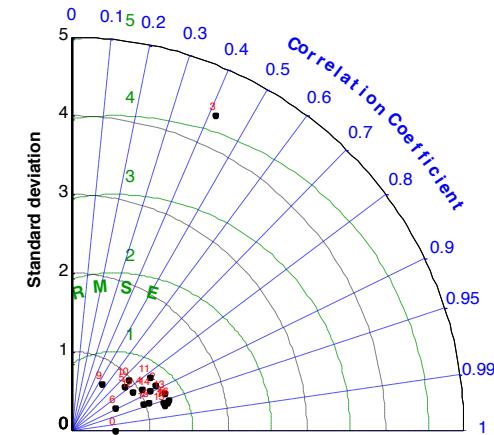
TMIN Region 9



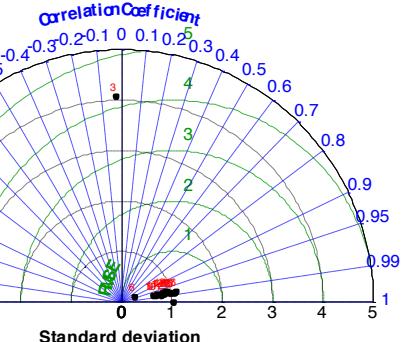
Performance Evaluation Tmax & Tmin for sub-region 10



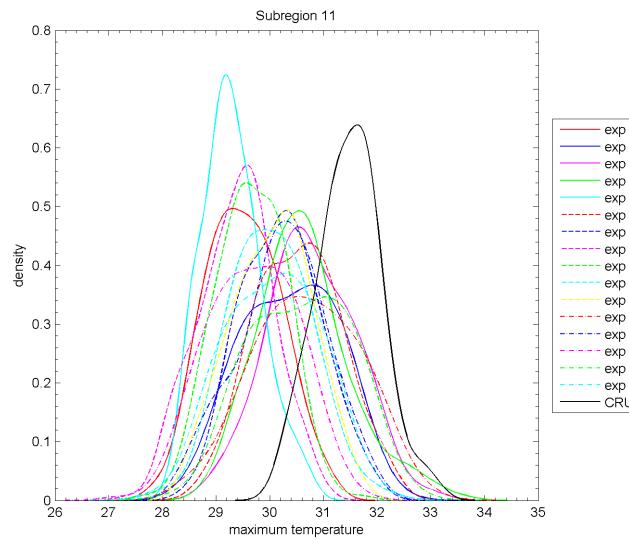
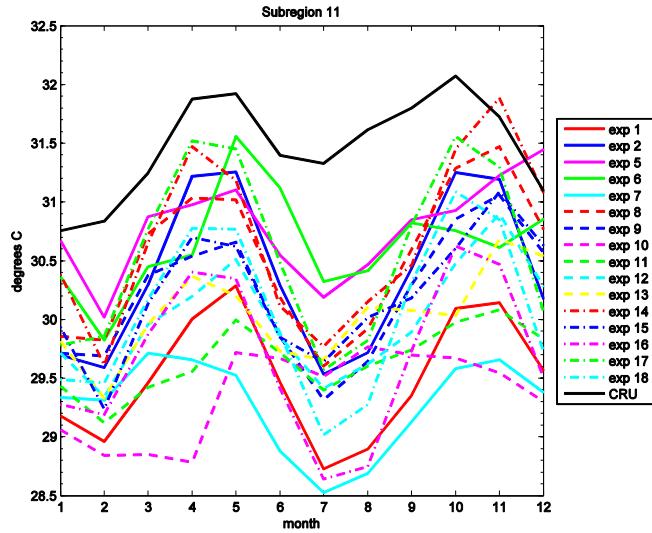
Best exp.16
TMAX Region 10



Best exp.2
TMIN Region 10

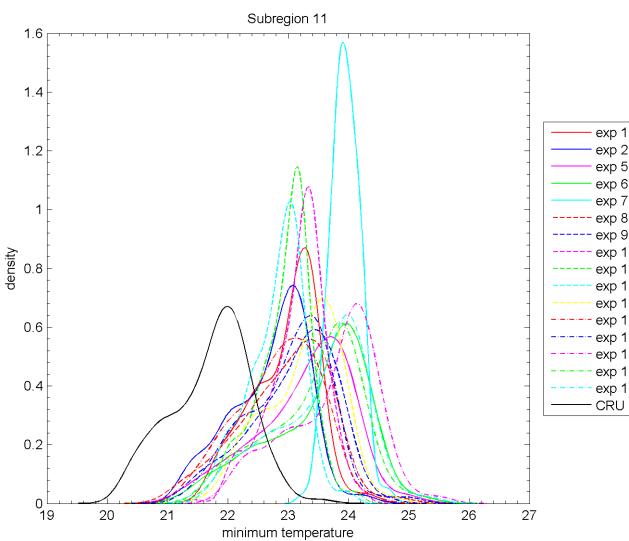
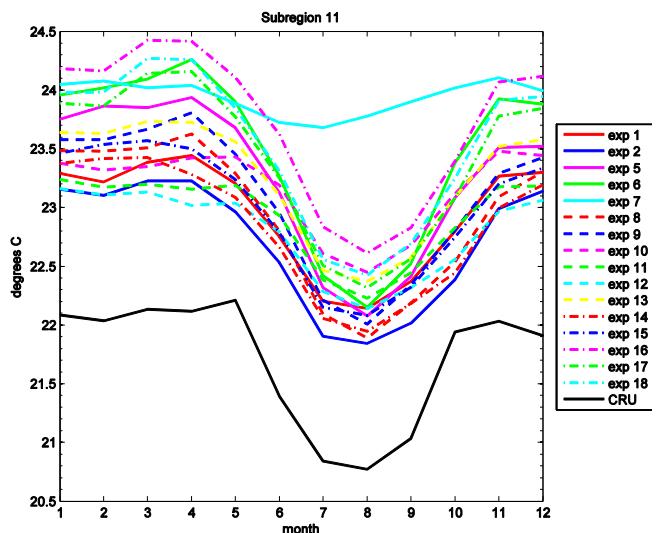
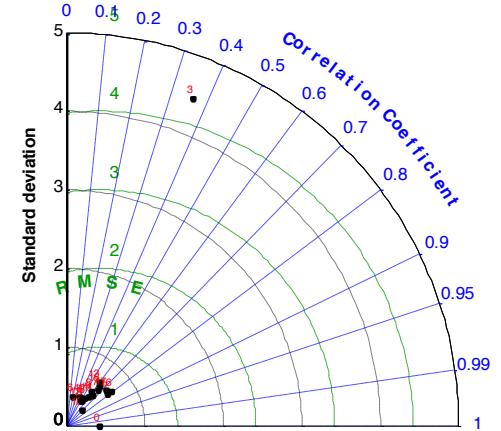


Performance Evaluation Tmax & Tmin for sub-region 11



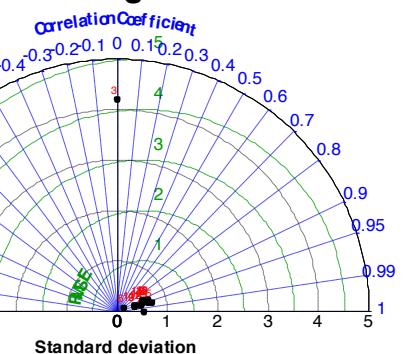
Best exp.11

TMAX Region 11

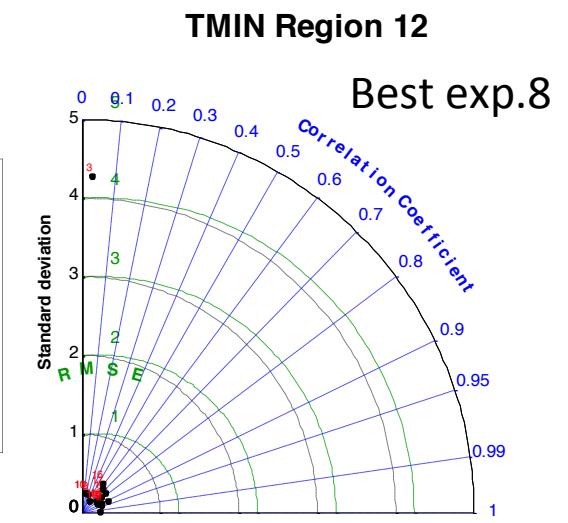
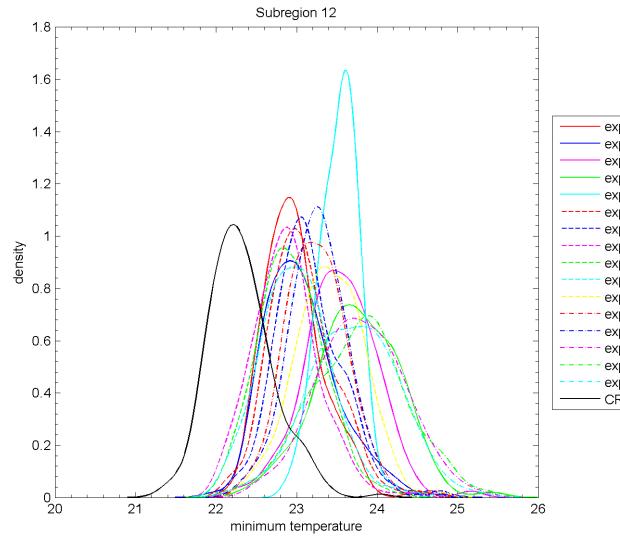
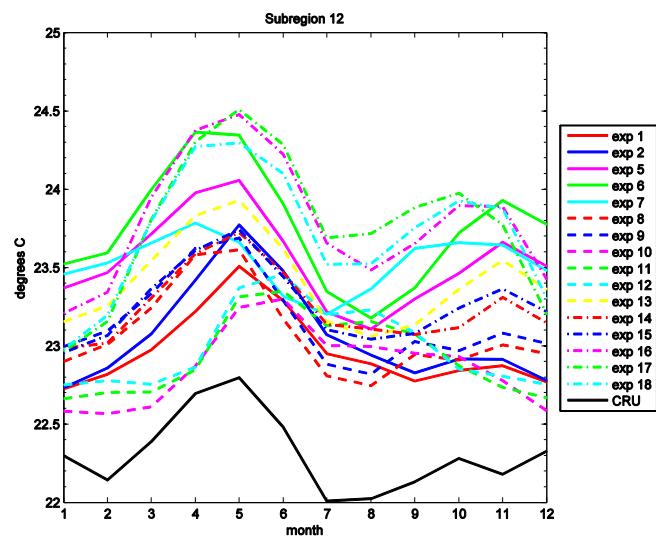
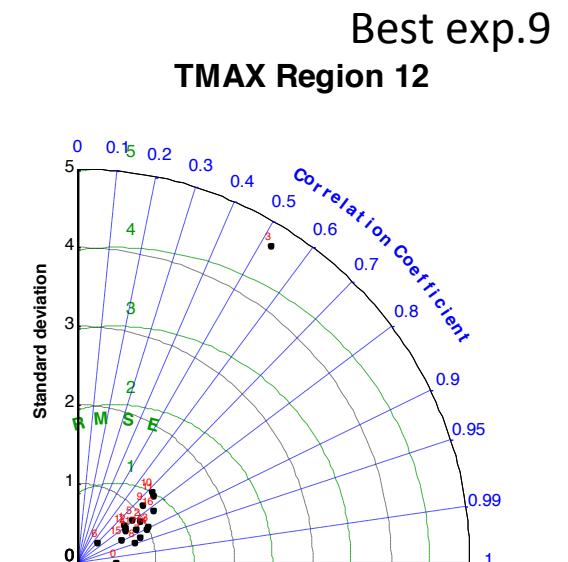
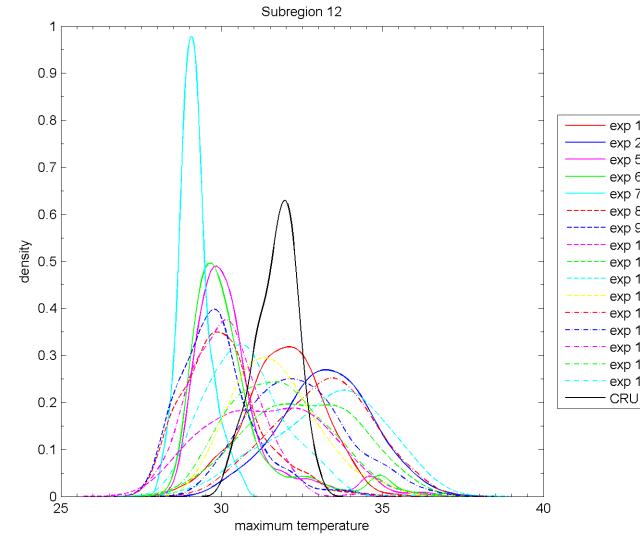
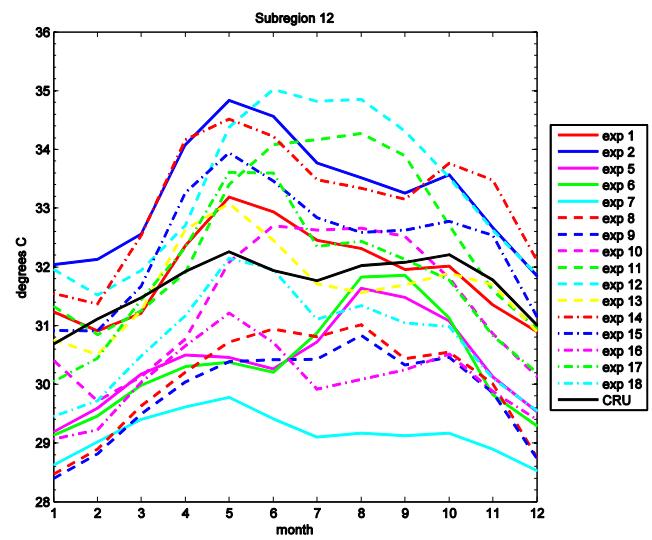


Best exp.11

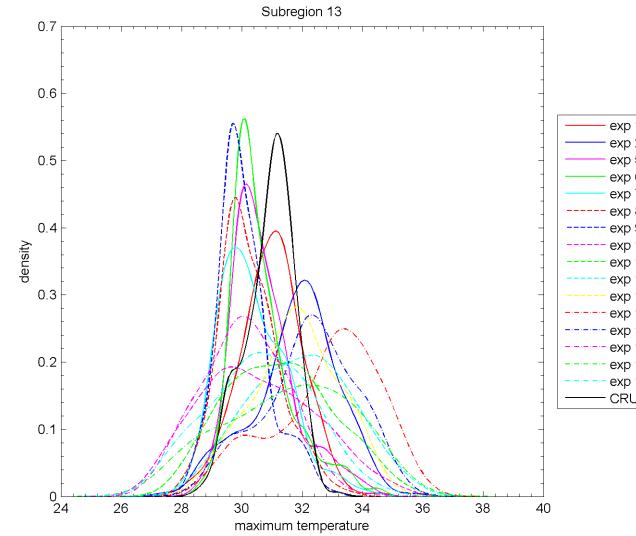
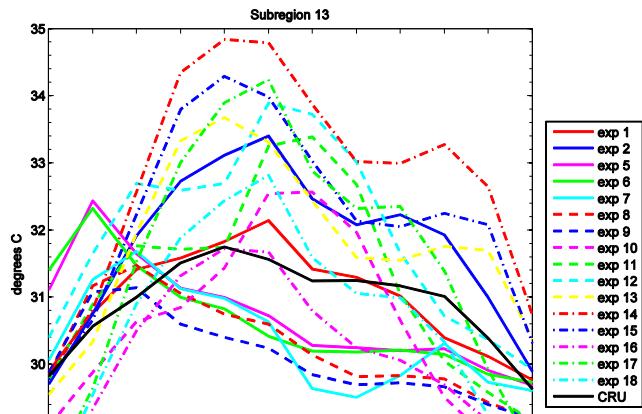
TMIN Region 11



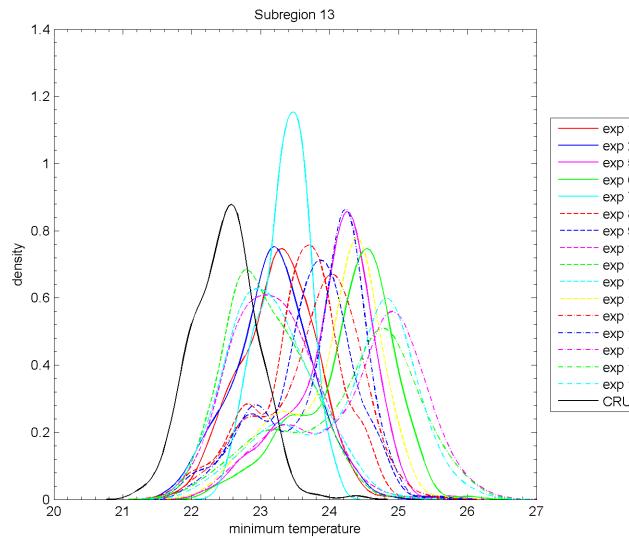
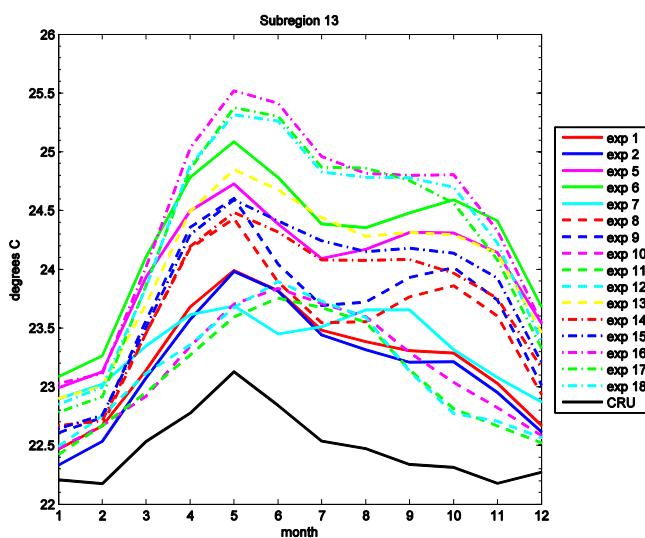
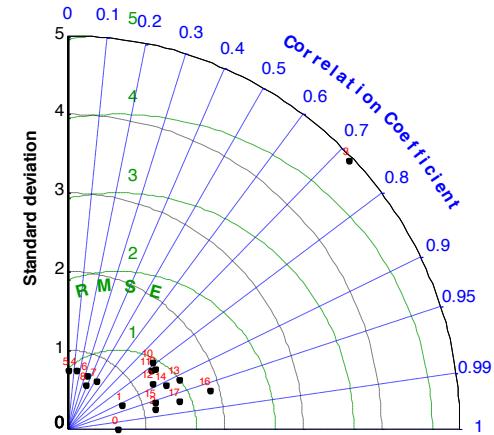
Performance Evaluation Tmax & Tmin for sub-region 12



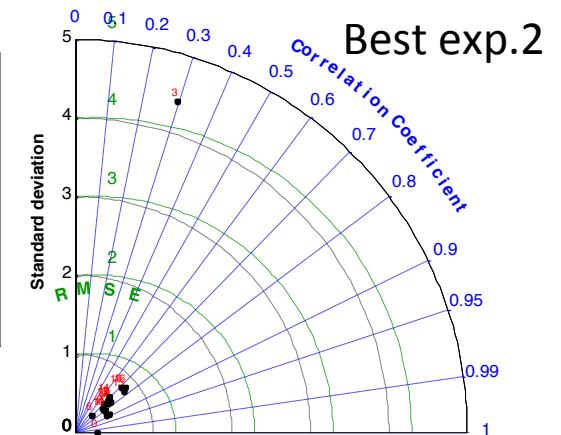
Performance Evaluation Tmax & Tmin for sub-region 13



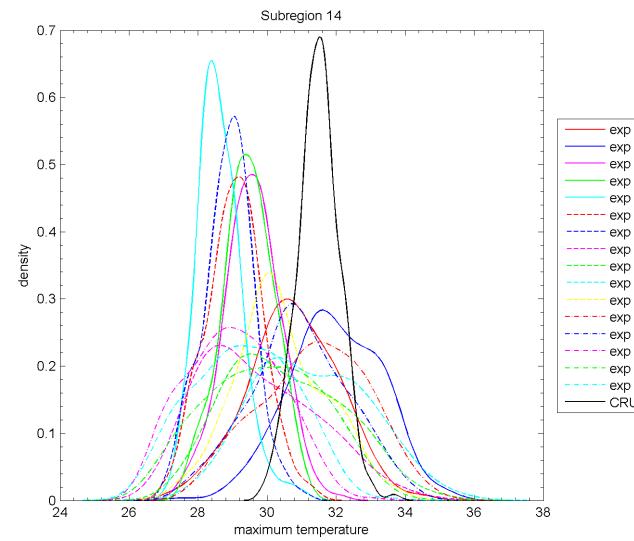
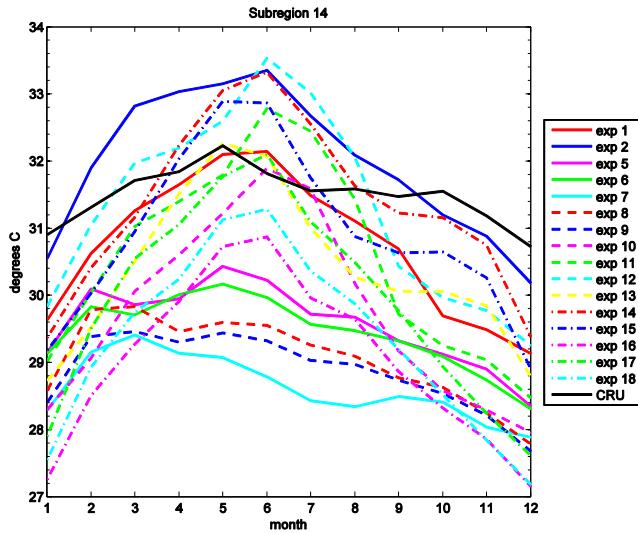
Best exp.2
TMAX Region 13



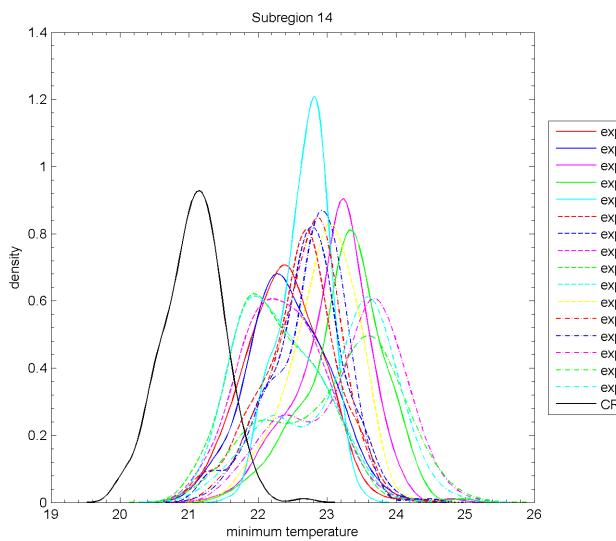
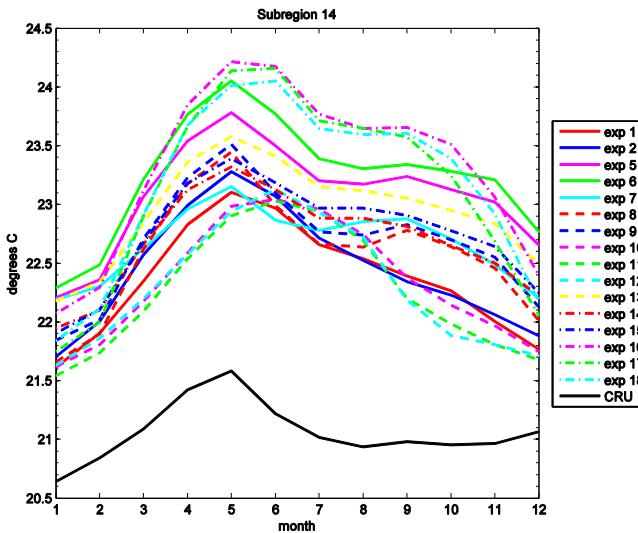
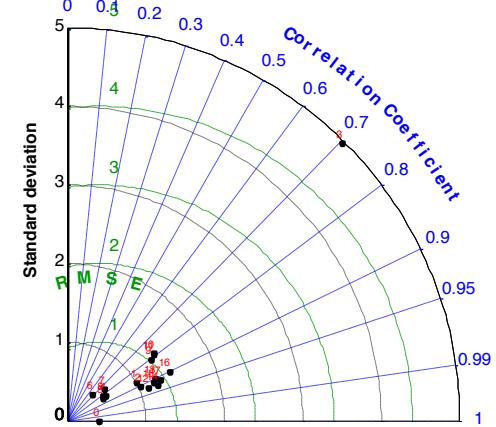
TMIN Region 13



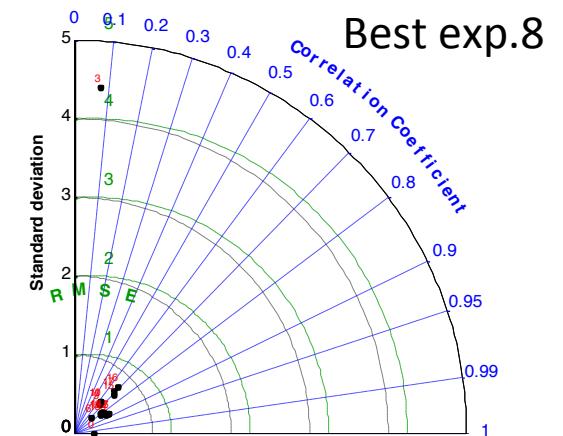
Performance Evaluation Tmax & Tmin for sub-region 14



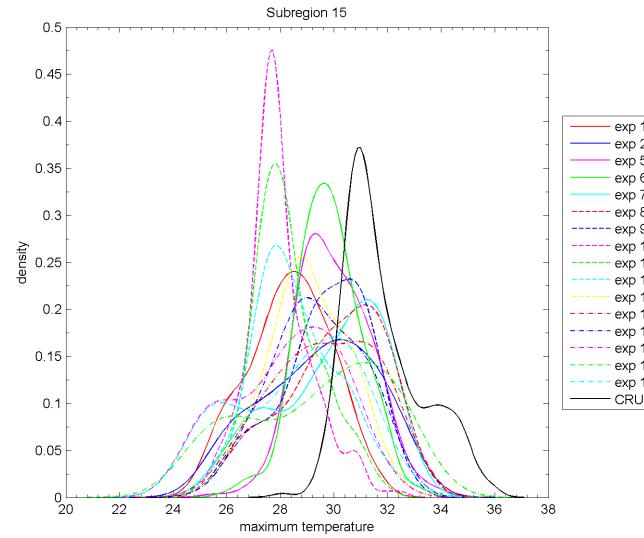
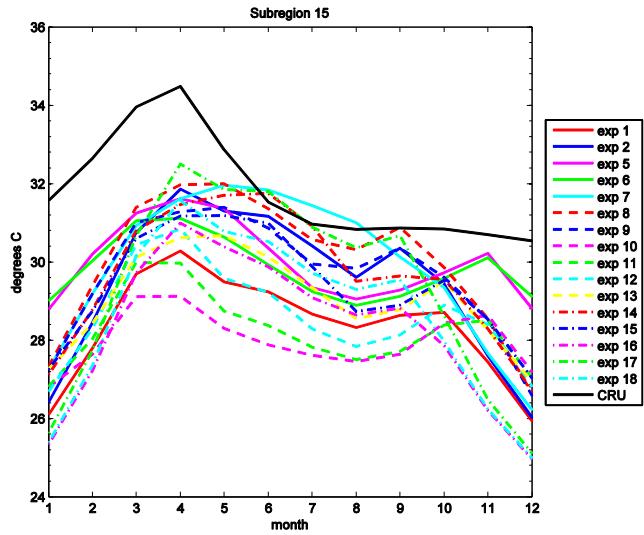
Best exp.9
TMAX Region 14



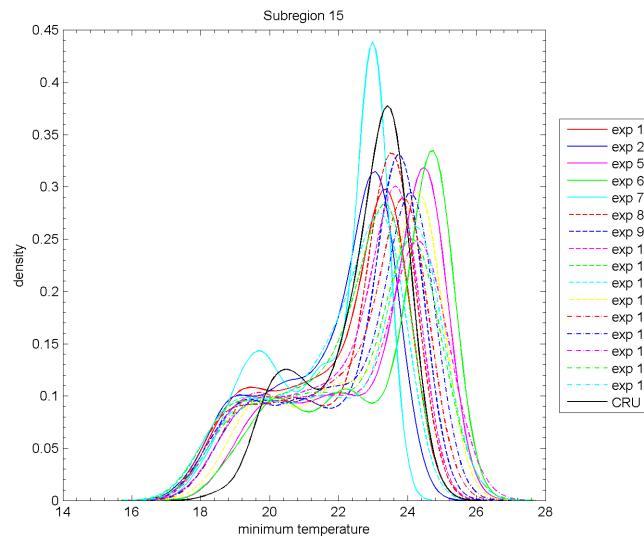
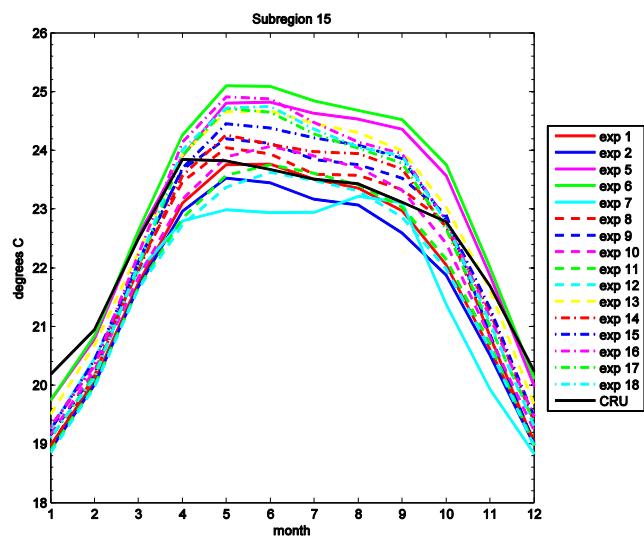
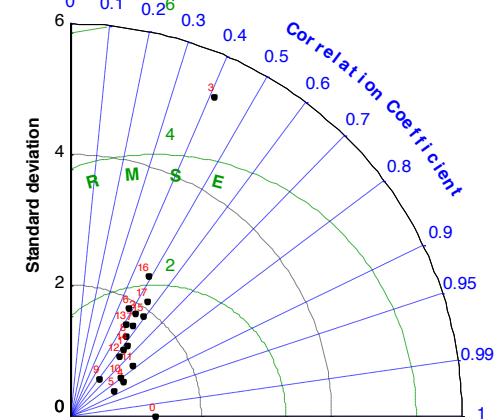
TMIN Region 14
Best exp.8



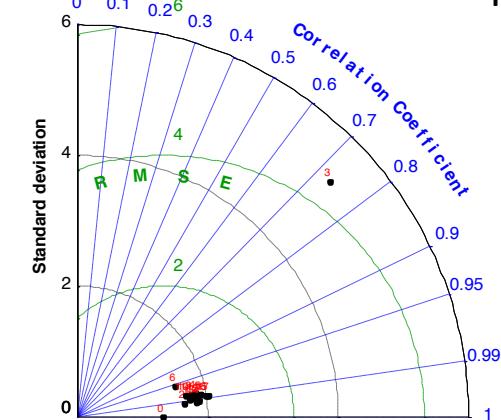
Performance Evaluation Tmax & Tmin for sub-region 15



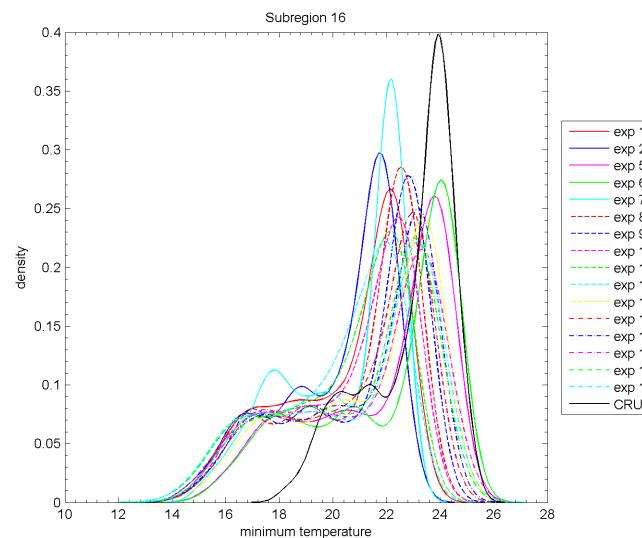
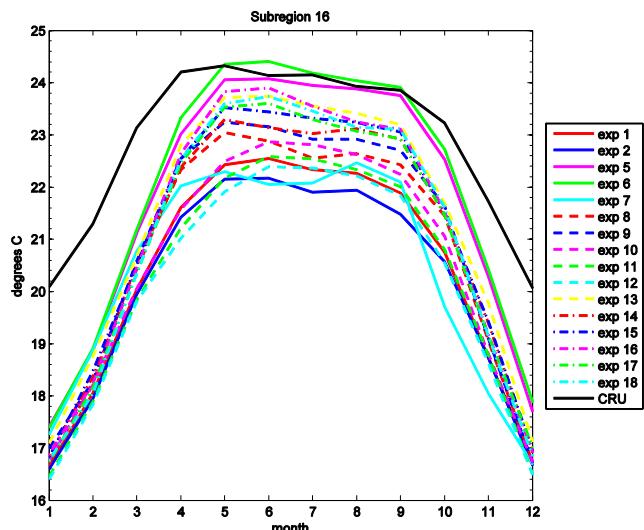
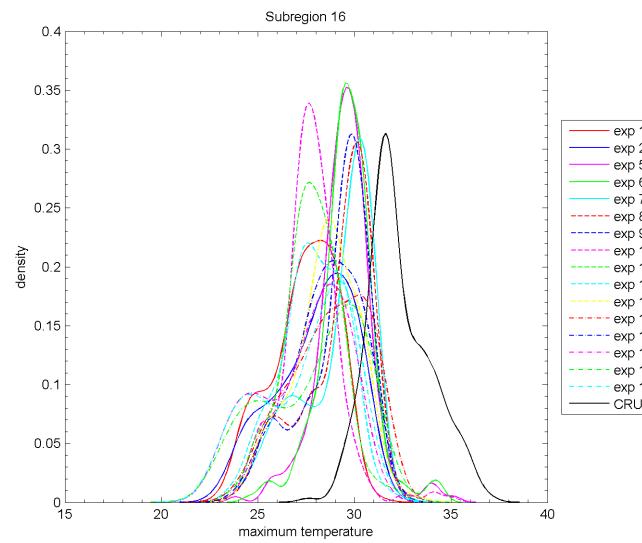
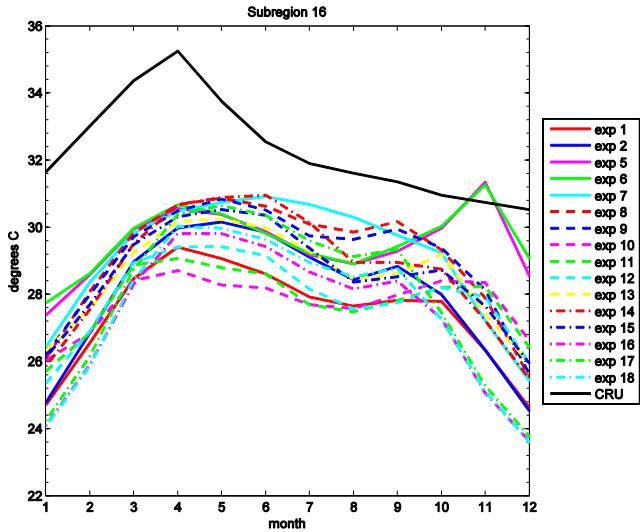
Best exp.6
TMAX Region 15



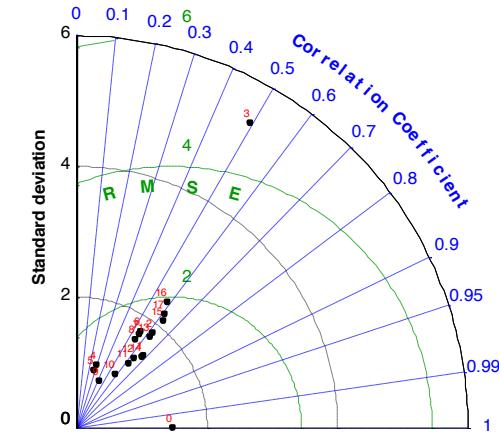
TMIN Region 15
Best exp.2



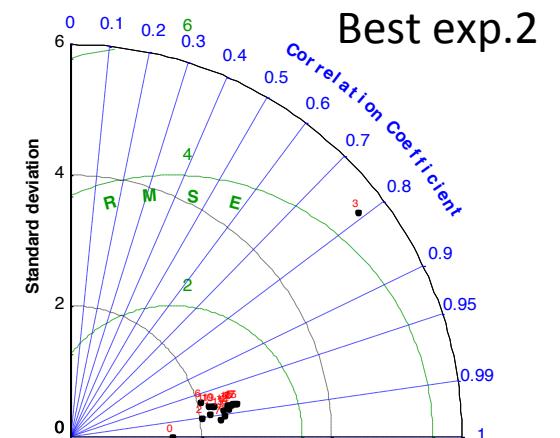
Performance Evaluation Tmax & Tmin for sub-region 16



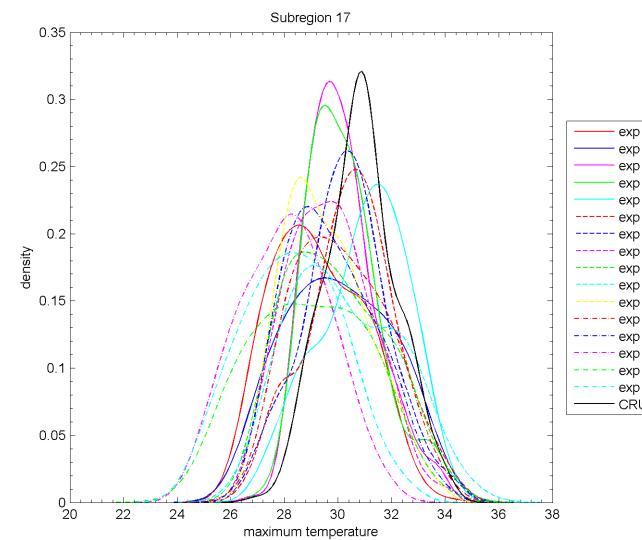
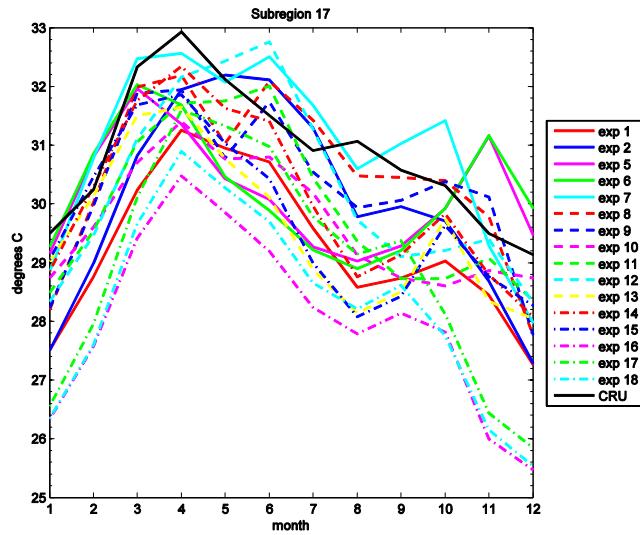
Best exp.15
TMAX Region 16



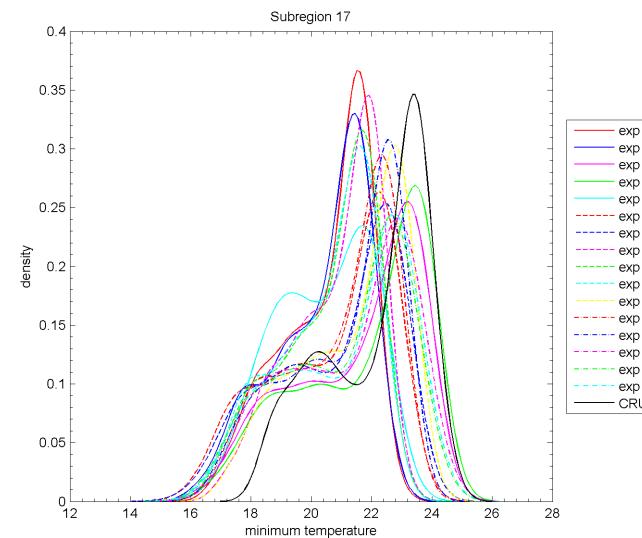
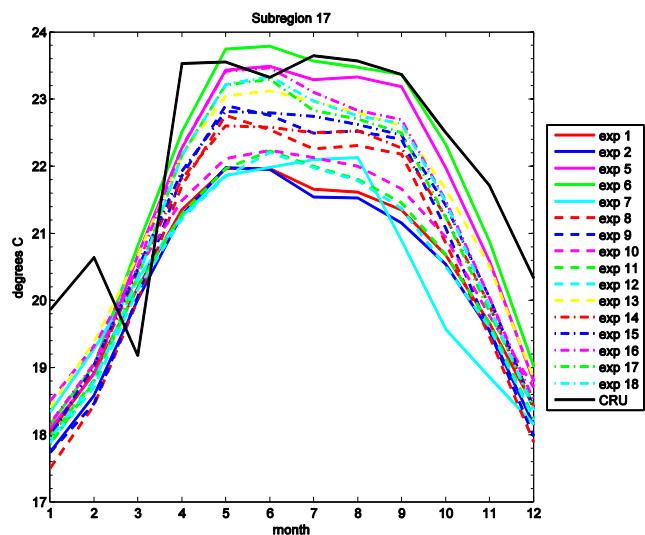
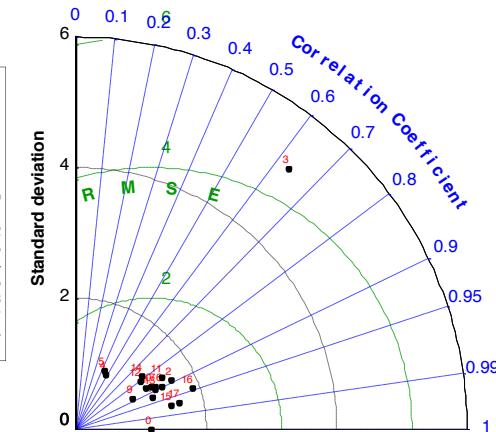
TMIN Region 16



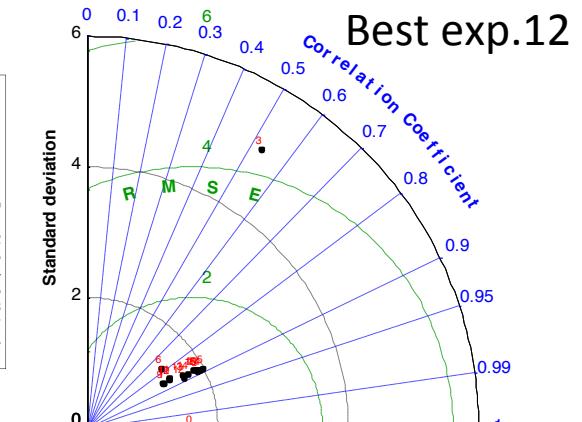
Performance Evaluation Tmax & Tmin for sub-region 17



Best exp.16
TMAX Region 17

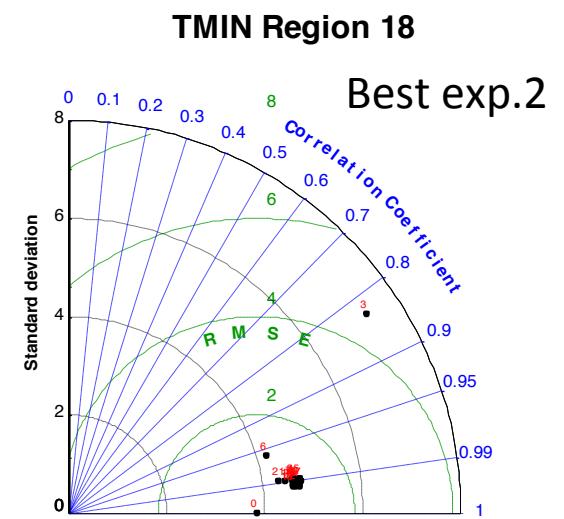
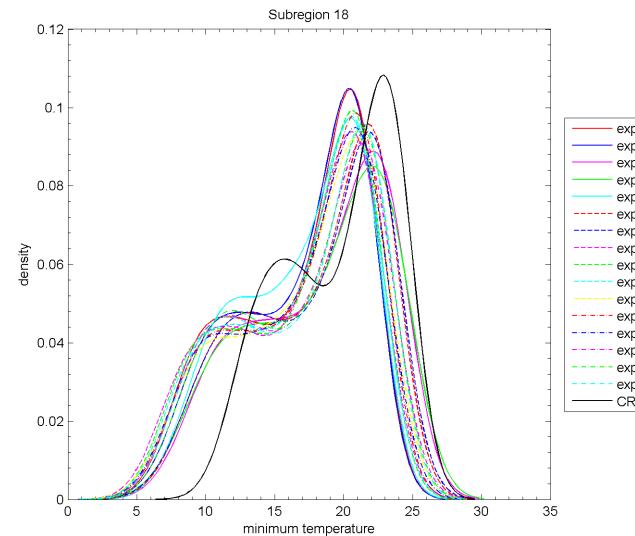
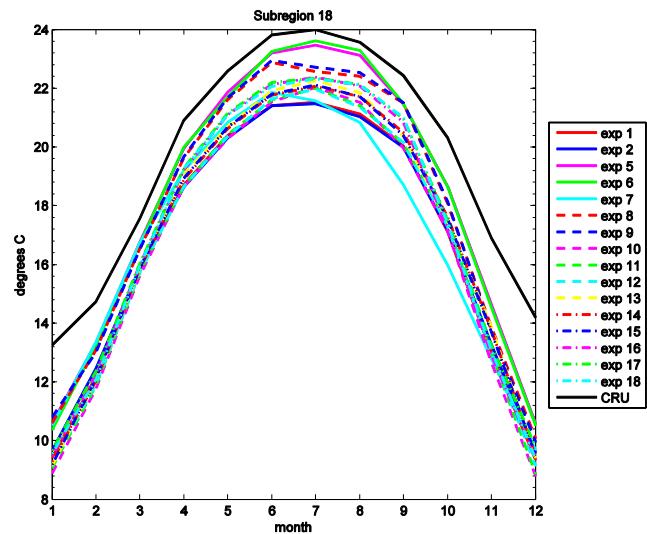
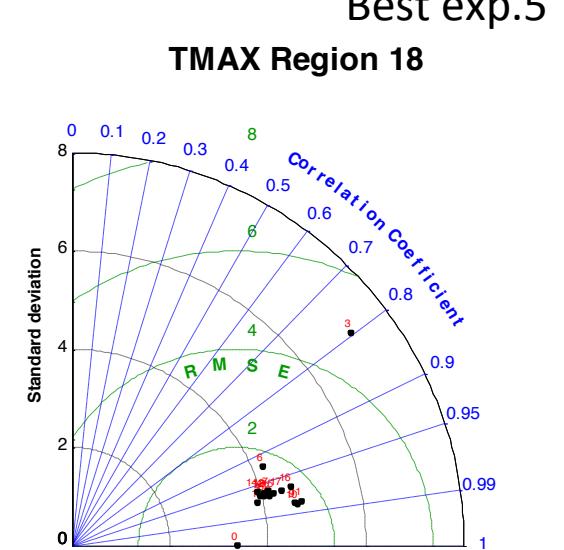
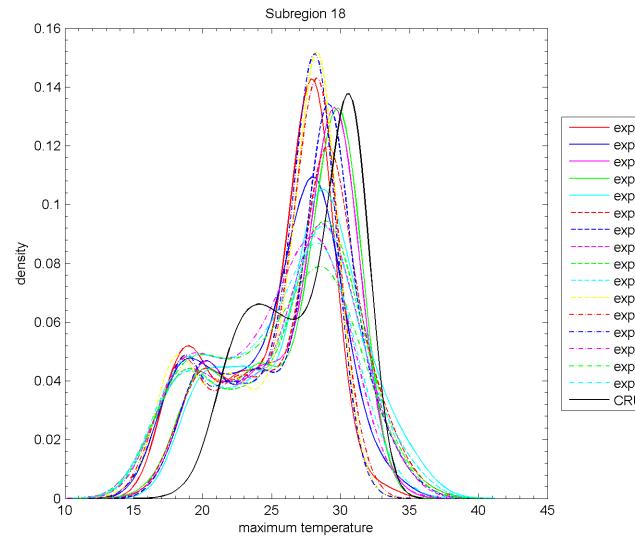
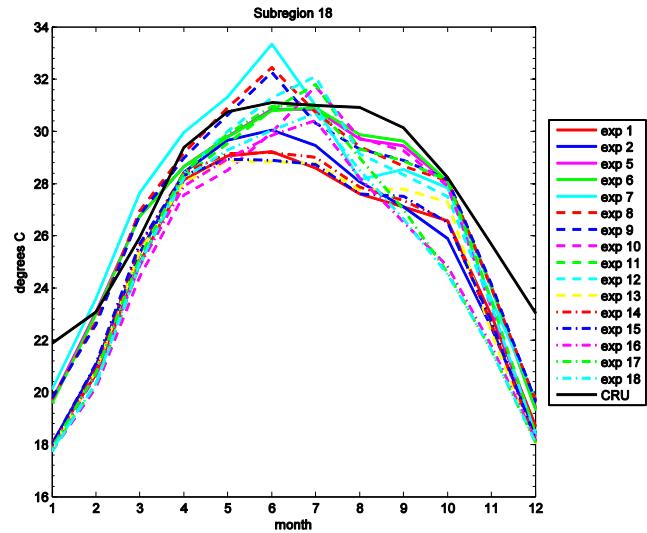


TMIN Region 17

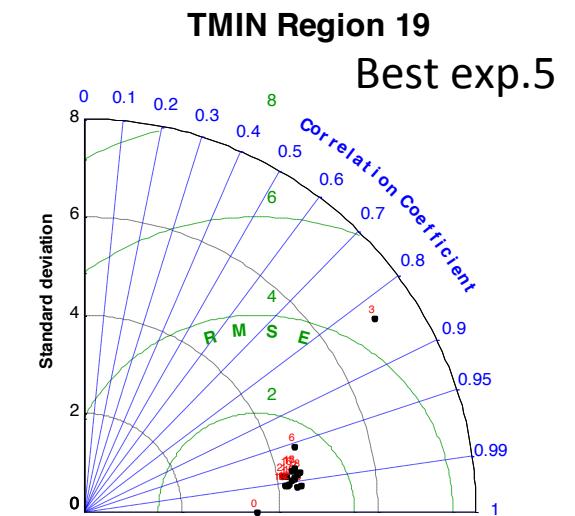
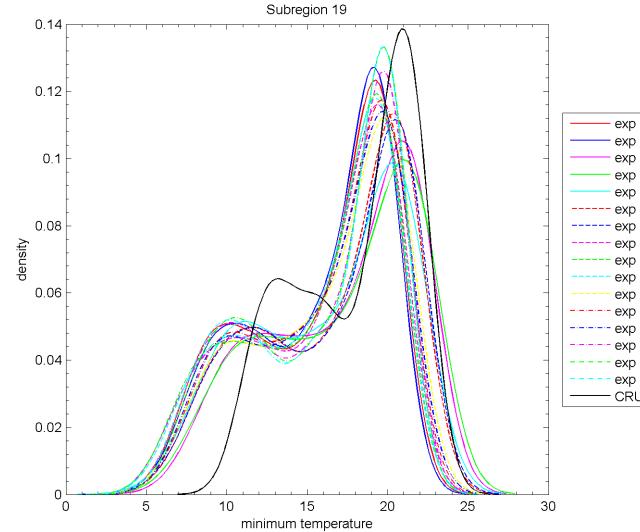
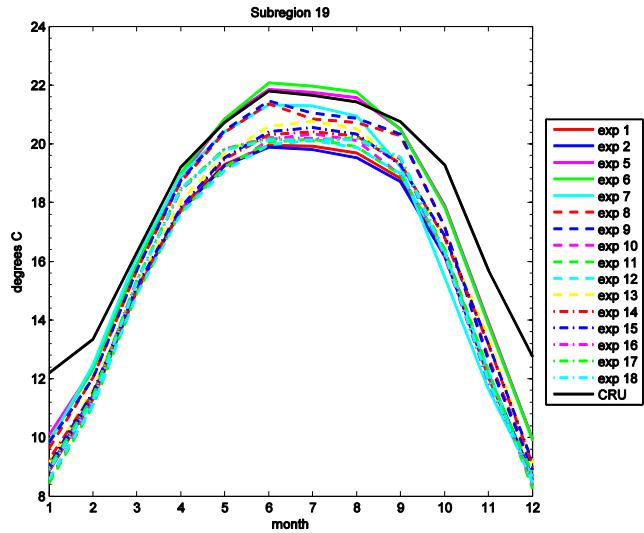
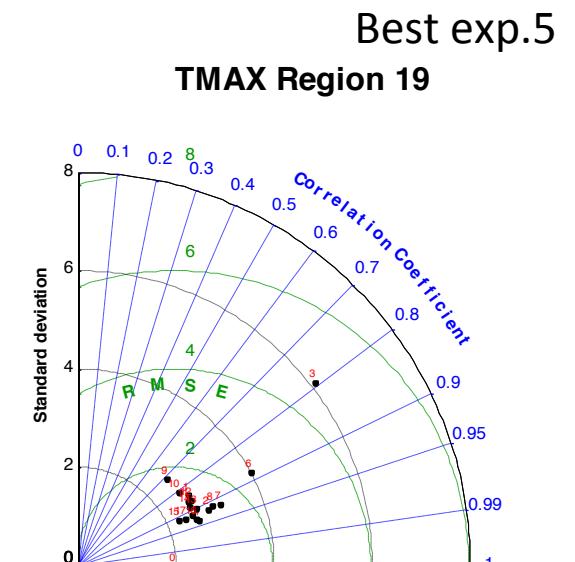
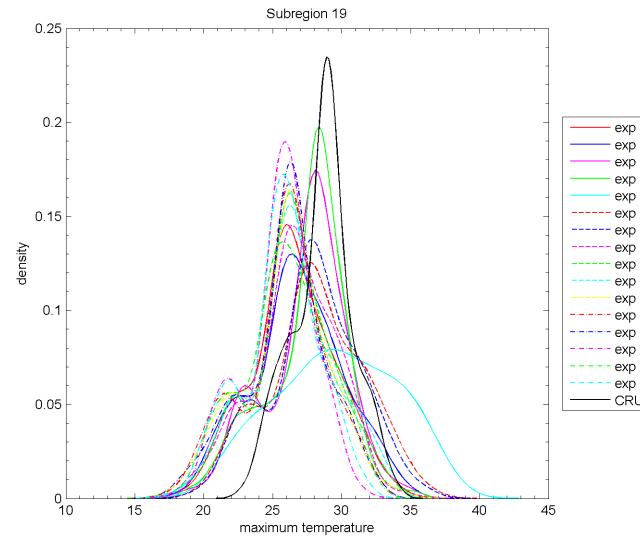
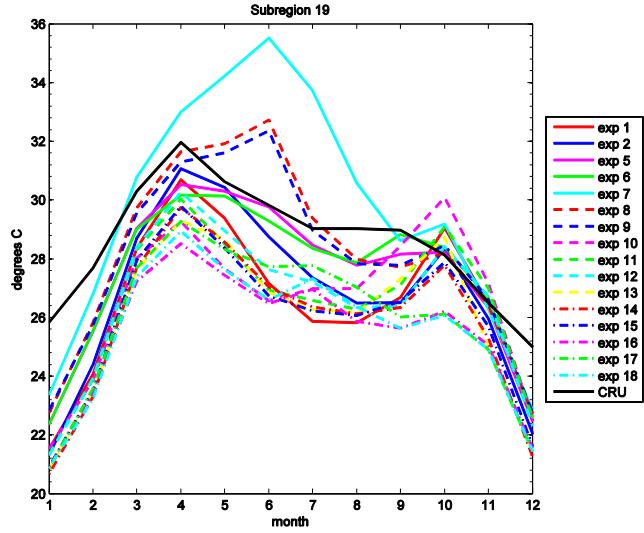


Best exp.12

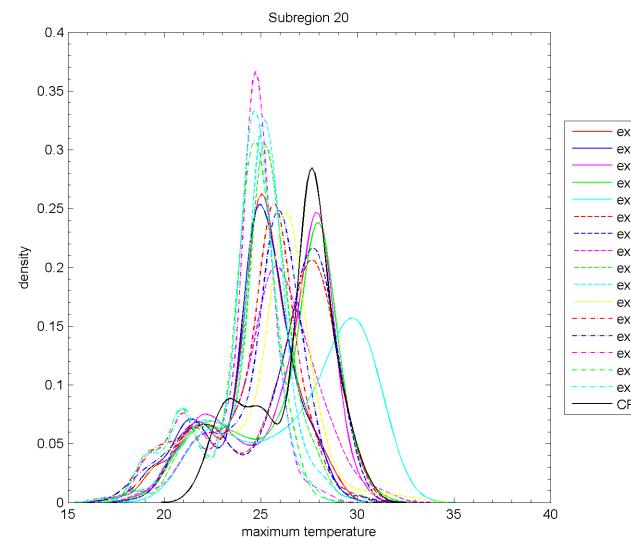
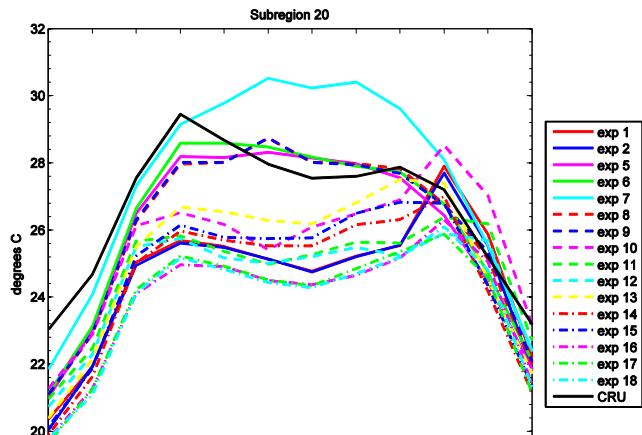
Performance Evaluation Tmax & Tmin for sub-region 18



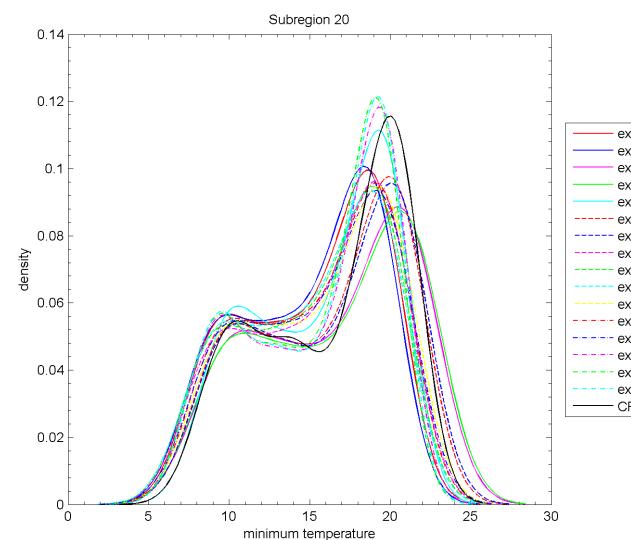
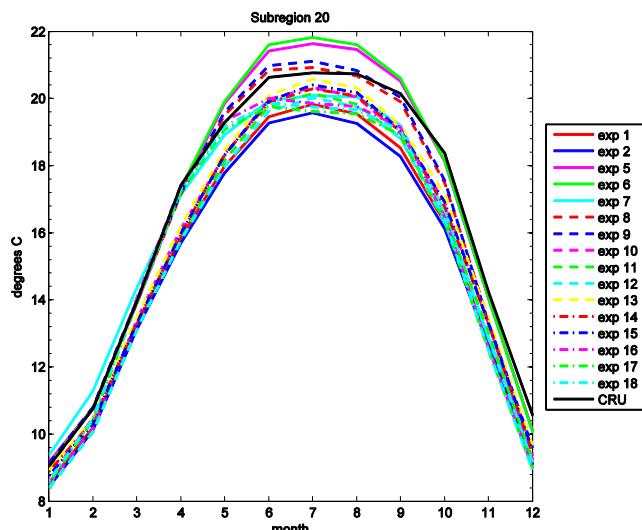
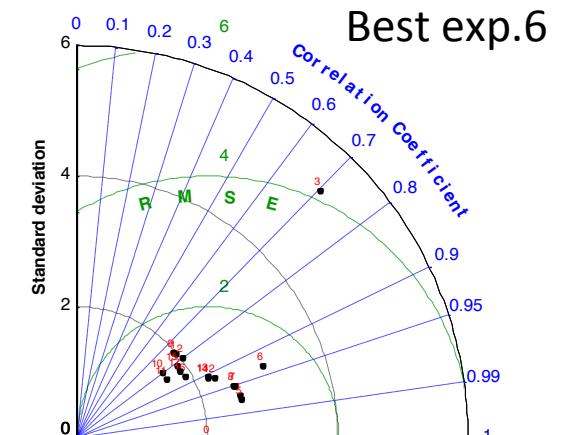
Performance Evaluation Tmax & Tmin for sub-region 19



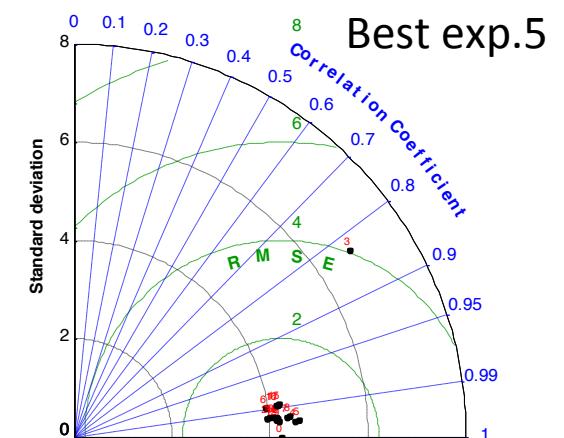
Performance Evaluation Tmax & Tmin for sub-region 20



TMAX Region 20



TMIN Region 20



Evaluation Summary

Status	Sub Region No.	
	Tmax	Tmin
Overestimate (all exp.)	8	1,2,6,7,9,10, 11,12,13,14
Underestimate (all exp.)	1,16	-

Sub Region	Best Exp. No. for Tmax	Best Exp. No. for Tmin	Sub Region	Best Exp. No. for Tmax	Best Exp. No. for Tmin
1	5	1	11	11	11
2	15	2	12	9	8
3	7	2	13	2	2
4	1	1	14	9	8
5	8	1	15	6	2
6	18	5	16	15	2
7	8	12	17	16	12
8	17	5/6	18	5	2
9	15	12	19	5	5
10	16	2	20	6	5

Based on Tmax and Tmin analysis on 16 experiments over 20 sub-regions:

Exp.5 (MIT Emanuel, Arakawa-Schubert, Zeng) tend to be the best for simulating Tmax while Exp. 2 (Grell, Arakawa-Schubert, BAT S1e) good for Tmin.

Exp. 16 (Kuo, Arakawa-Schubert, BAT S1e) tend to be the best for Tmax and Exp. 2 for Tmin simulations only for Indonesia region.

Overall, exp.5 tend to be the best experiments overall.

Thank You