ESA-CCI CMUG Workpackages

WP3.9 Assessments of glaciers, land cover and sea-level data for hydrological modelling of the Arctic ocean drainage basin

WP3.8 Cross-assessments of clouds, soil moisture, water vapour and radiation in observations and regional climate models

WPO3.4 Cross-assessment of clouds, aerosols, sea level, ocean colour, SST, water vapour and radiation in observations and global climate models

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WP3.10 Cross assessment of SST, SI, ocean colour and sea-level data for ocean model
Omar Bellprat

WP4.2 Assessing CCI SST and Sea-Ice datasets as boundary conditions in CCI4MIP simulations. Serge Planton

WP5.1 Benchmarking models with ESA-CCI data: Implement metrics from WPO3.4 into ESMValtool. Mattia Righi

WP3.8 Cross-assessment of clouds, soil-moisture, water vapour and radiation for regional climate variability

SMHI

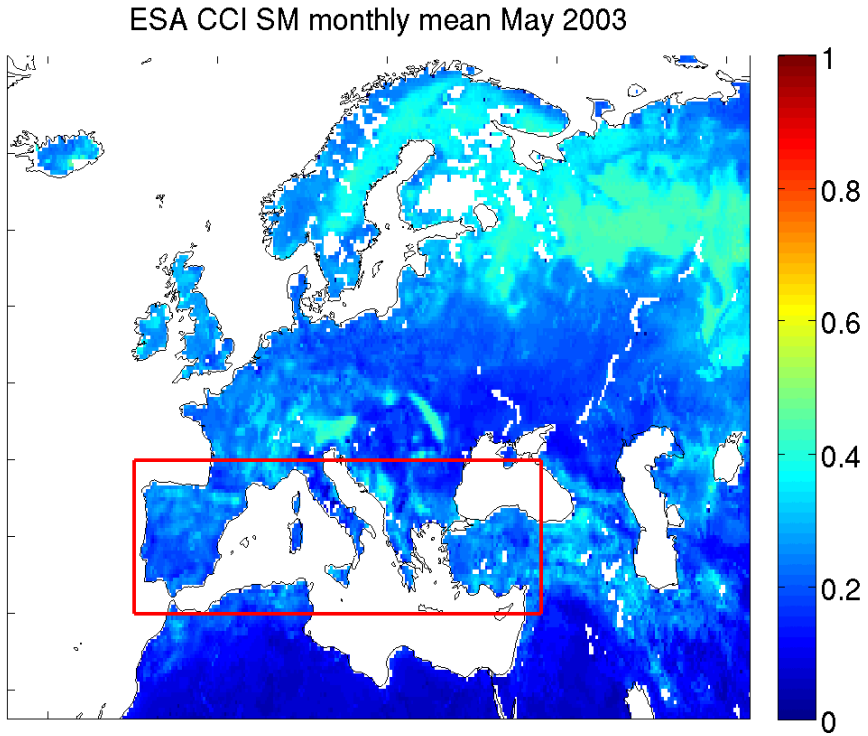
David Lindstedt, Petter Lind, Ulrika Willén



Evaluate precipitation, cloud and soil moisture interactions on regional scale.

Harmonie Non-hydrostatic regional Climate model (HCLIM) run over Europe, horizontal reolution 15km, 1998-2007 with ERA-Interim boundary data.

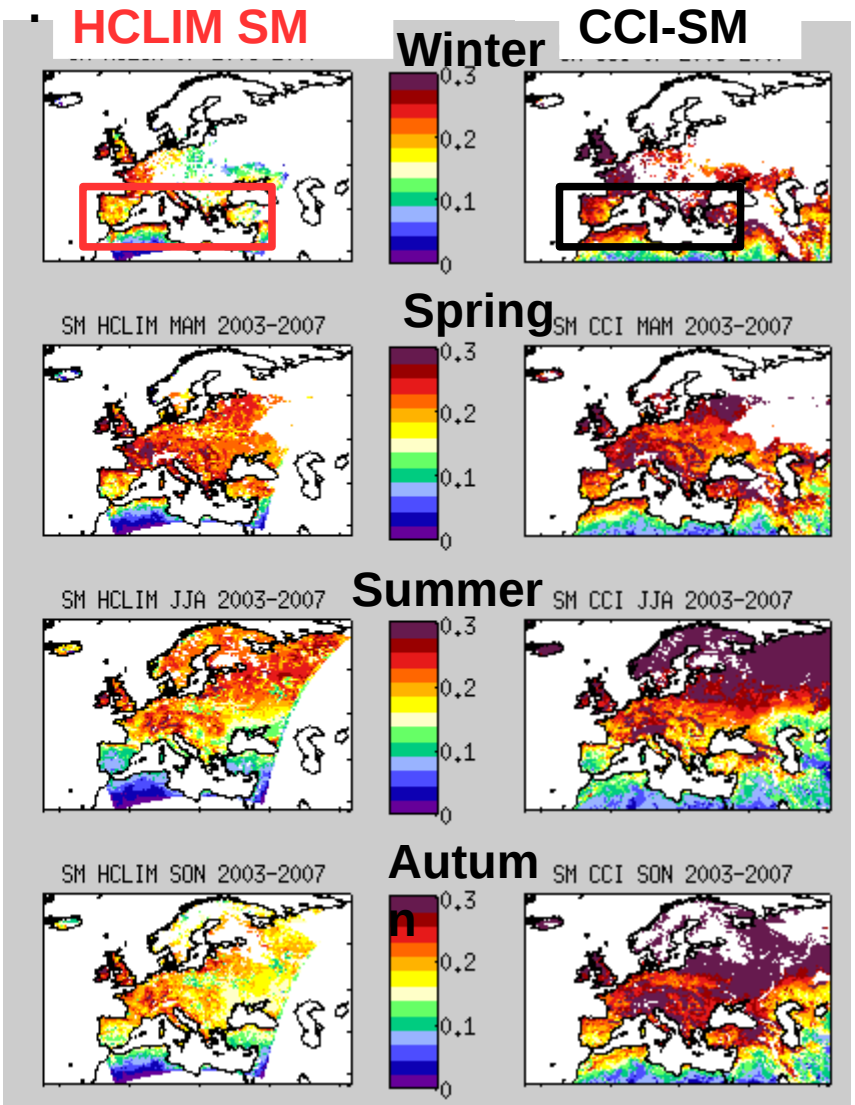
Waiting to analyse a 30 year 6km simulations to be ready July 2016



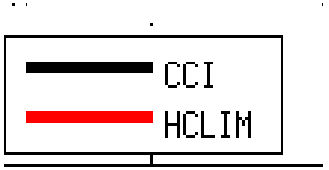
WP3.8 Cross-assessment of ECV's for regional climate variability

SMHI

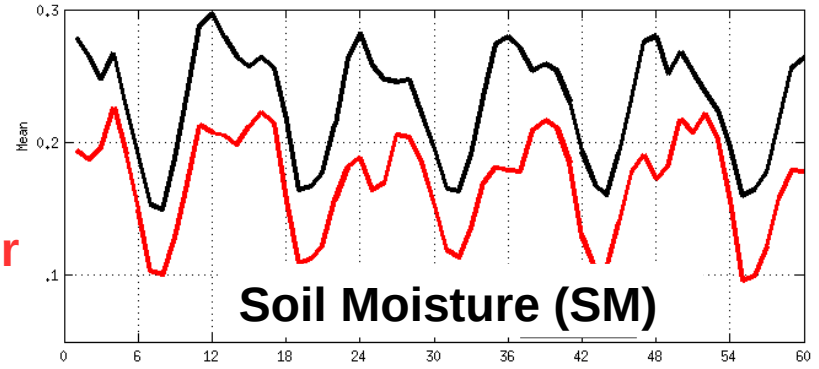
Comparing Degree of Saturation (DoS)
DoS = 0 for completely dry soil.
DoS = 1 for a totally wet soil (at porosity).

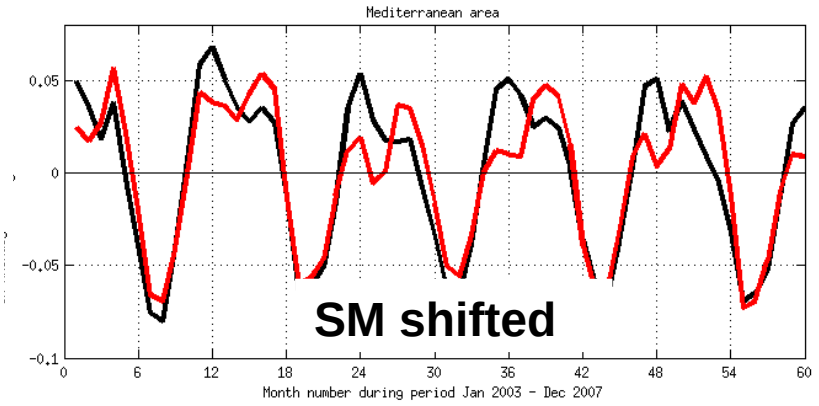


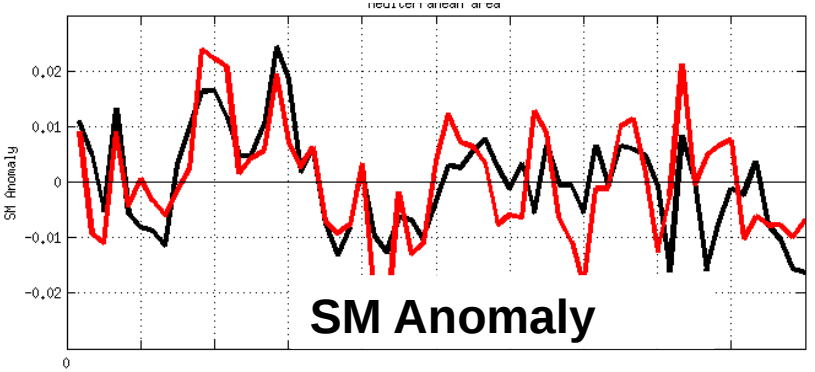
HCLIM
Top SM layer
1cm



Mediterranean monthly mean land







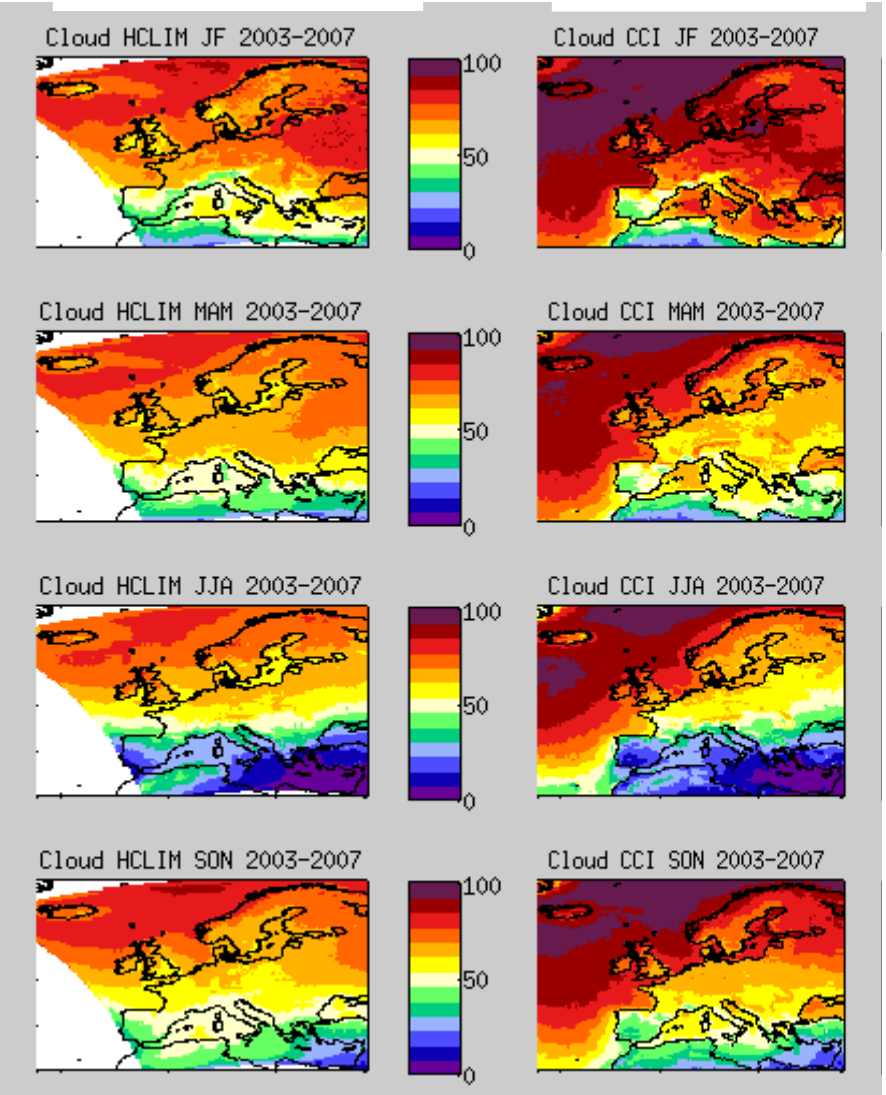
Month number Jan 2003-Dec 2007

WP3.8 Cross-assessment of ECV's for regional climate variability

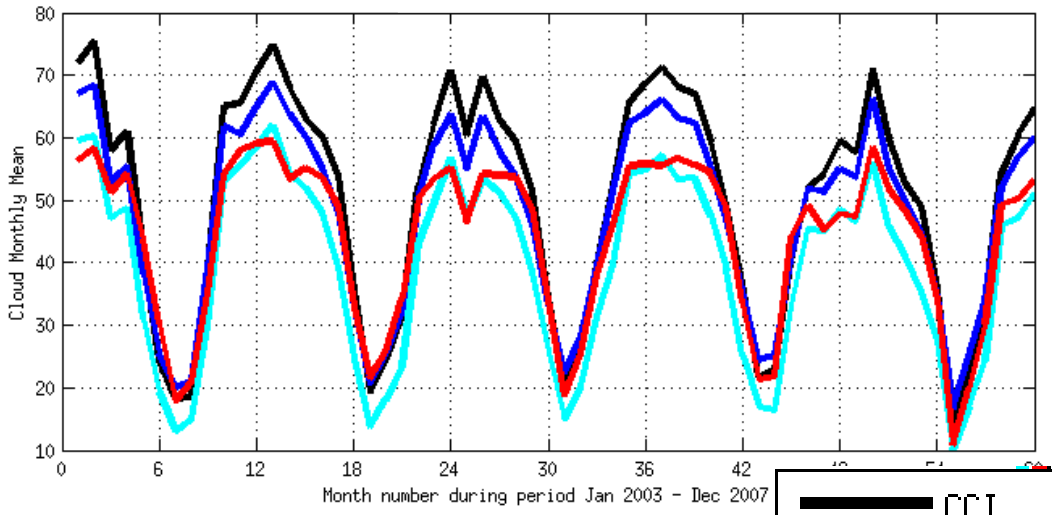
SMHI

Comparing HCLIM, CCI , CLARA-a2 and ERA-Interim Cloud cover (no simulator...)

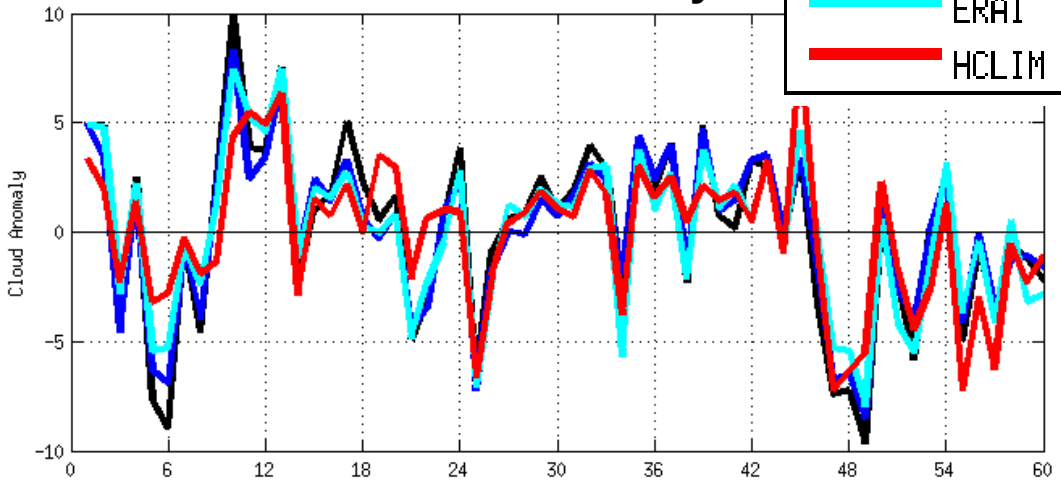
HCLIM Clouds | **CCI-Clouds**



Cloud cover



Cloud anomaly



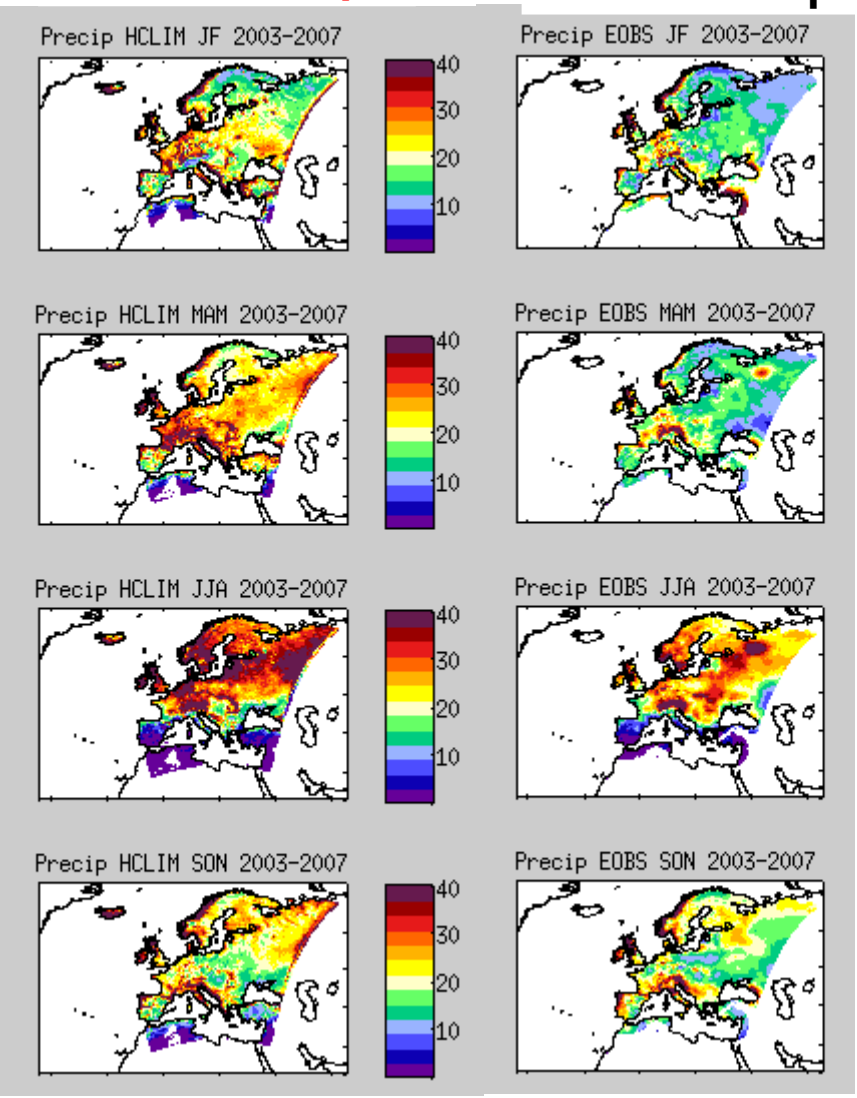
Month number Jan 2003-Dec 2007

WP3.8 Cross-assessment of ECV's for regional climate variability

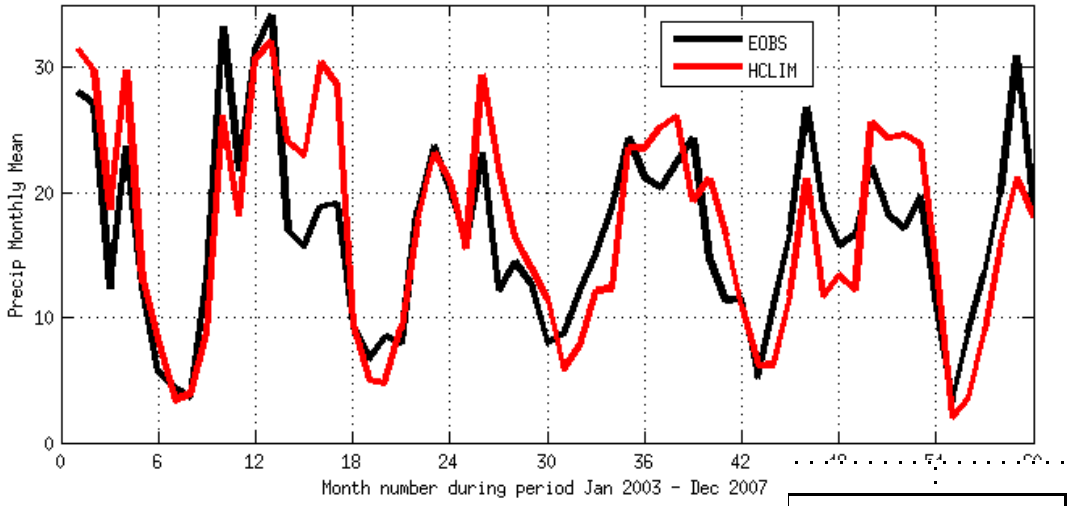
SMHI

Comparing HCLIM and EOBS (gridded surface data) precipitation

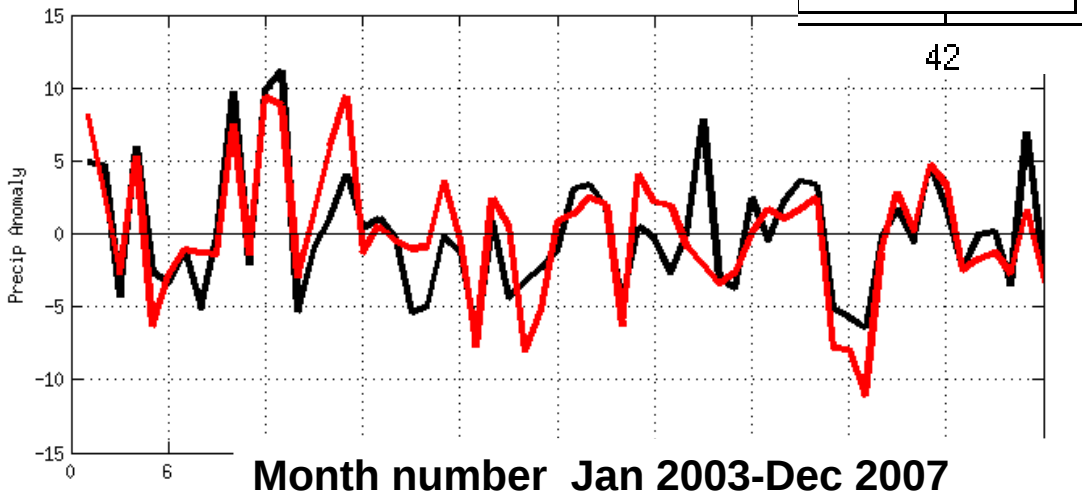
HCLIM Precip | **EOBS Precip**



Precipitation



Precipitation anomalies

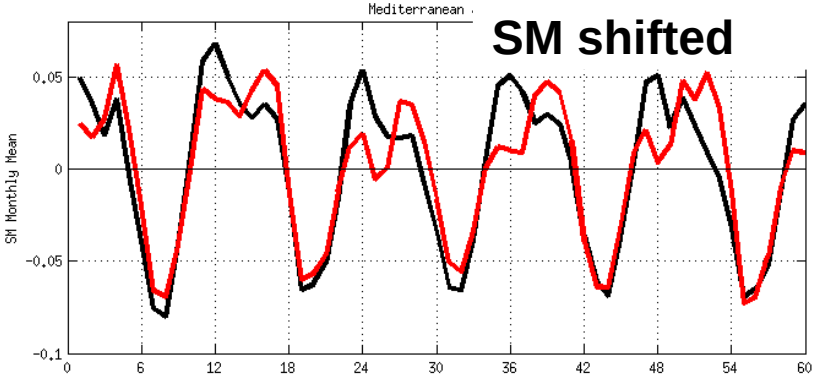


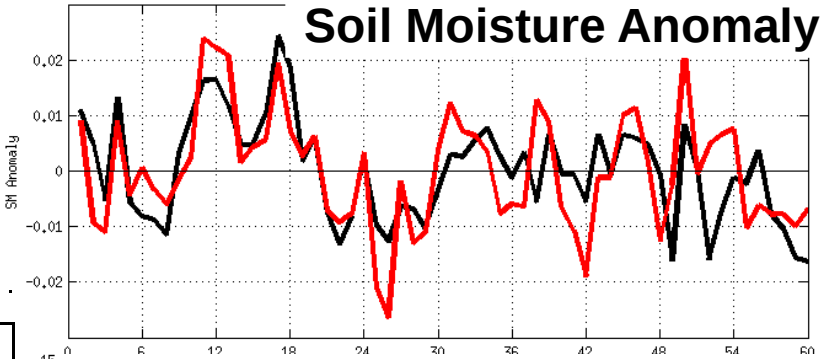
WP3.8 Cross-assessment of ECV's for regional climate variability

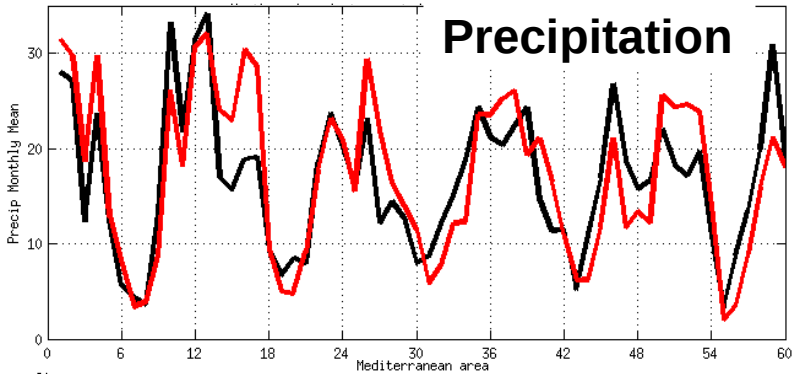
SMHI

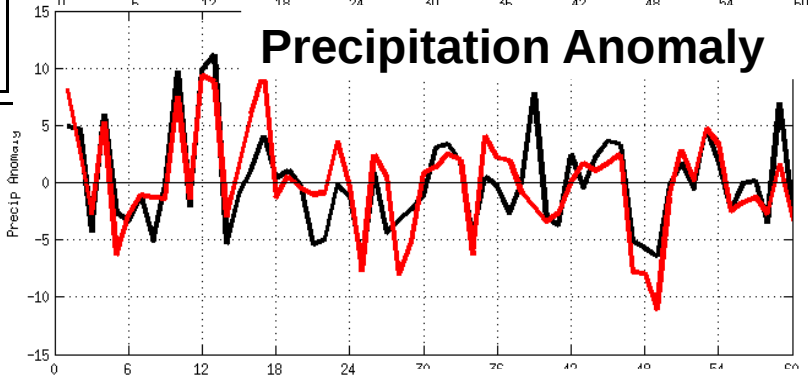
- Bias obs/model for SM and Clouds
+ Identify seasonal model/obs errors

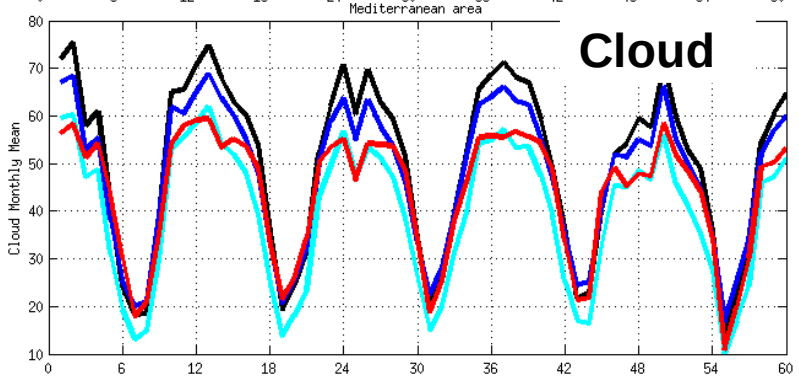
+ Observed and modelled variabilty similar for each ECV and across ECV's...

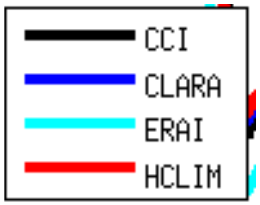


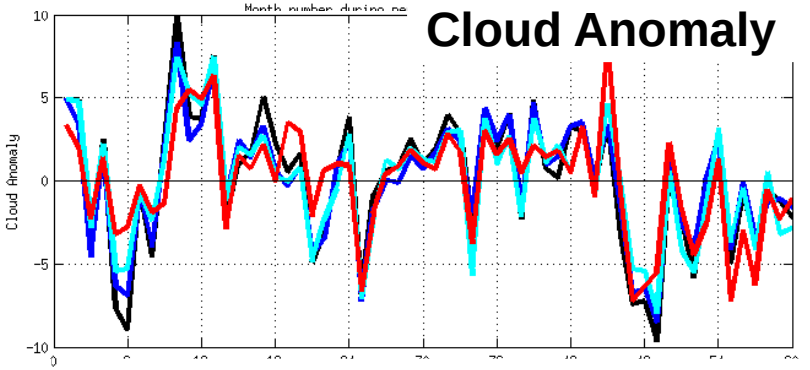












Month number Jan 2003- Dec 2007

Month number Jan 2003- Dec 2007

WPO3.4 Cross-assessment of clouds, SST, sea level, (ocean colour, aerosols), water vapour and radiation for global climate variability

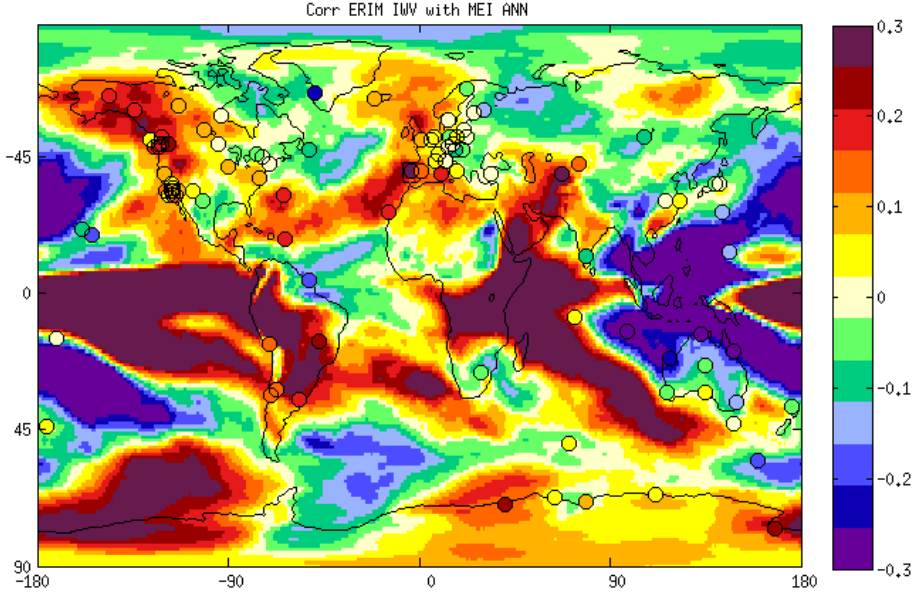
SMHI

Ulrika Willén, Martin Evaldsson, Abhay Devasthale

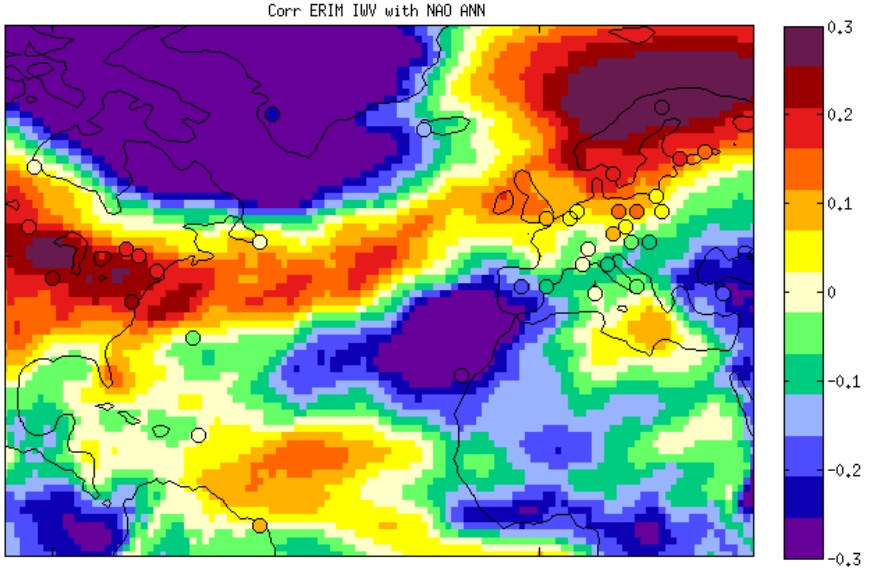


Evaluate teleconnection (ENSO, IOD, NAO) patterns in observations using CCI ECVs and other ECVs, investigating known relationships, climate indices, such as between SST and rainfall for ENSO index and aim to derive new metrics, observational constraints.

IWV ERIM and GPS stations correlation with ENSO

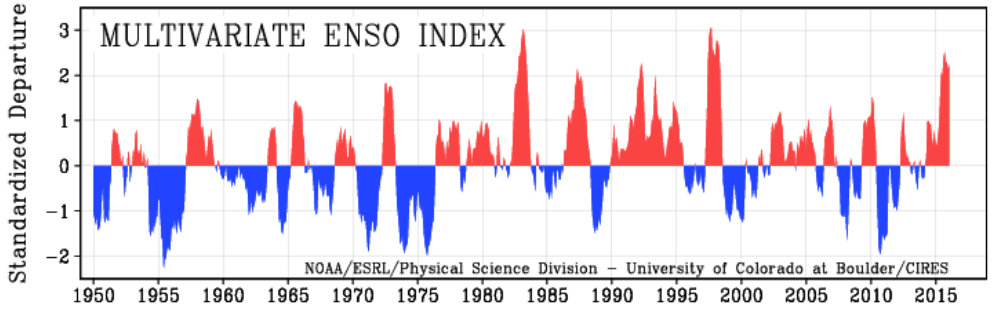


IWV ERIM and GPS stations correlation with NAO

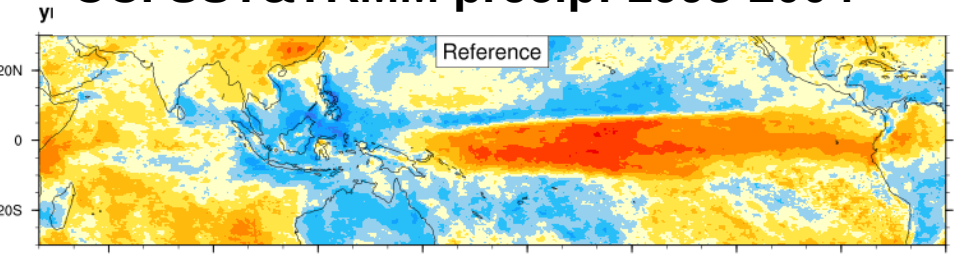


WPO3.4 Cross-assessment of ECV's for global climate variability

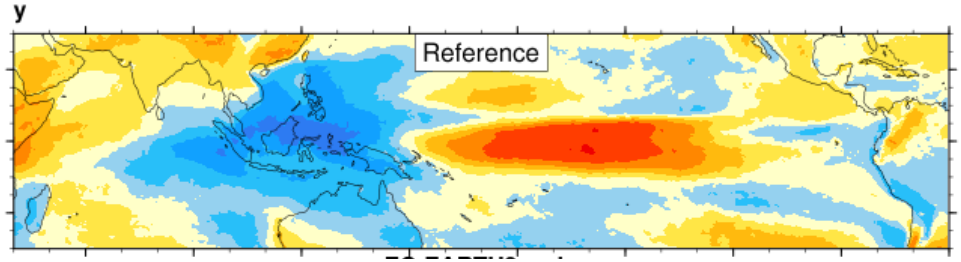
Example:
ENSO correlations for CCI SST and Clouds with TRMM and GPCP precipitation and CERES OLR all different timeperiods

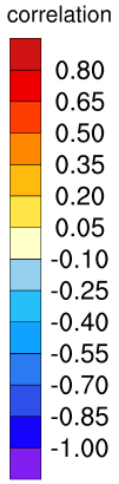


CCI SST&TRMM precip: 1998-2004

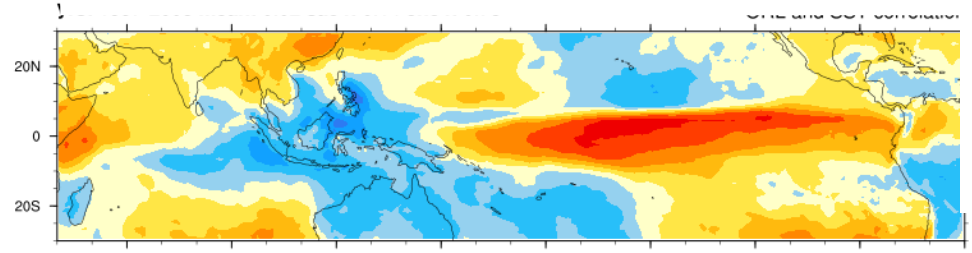


CCI SST&CCI Cloud: 1992-2008

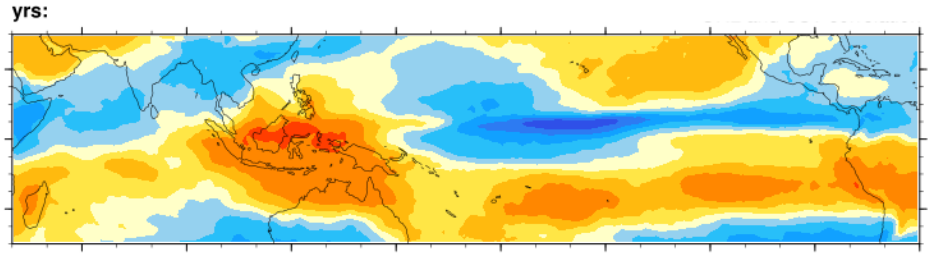




CCI SST&GPCP precip: 1997-2008



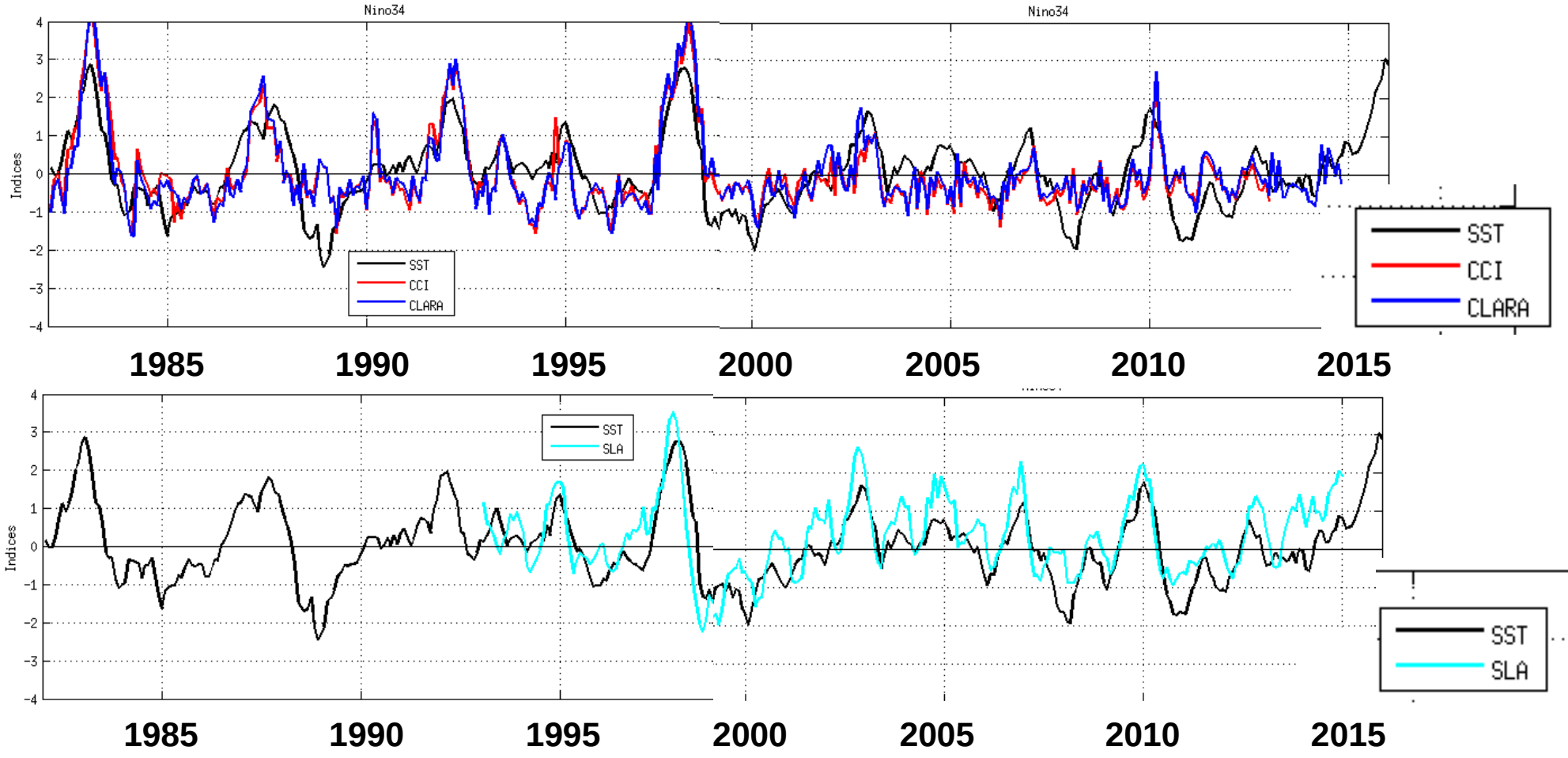
CCI SST&CERES OLR: 2001-2008



WPO3.4 Cross-assessment of ECV's for global climate variability

SMHI

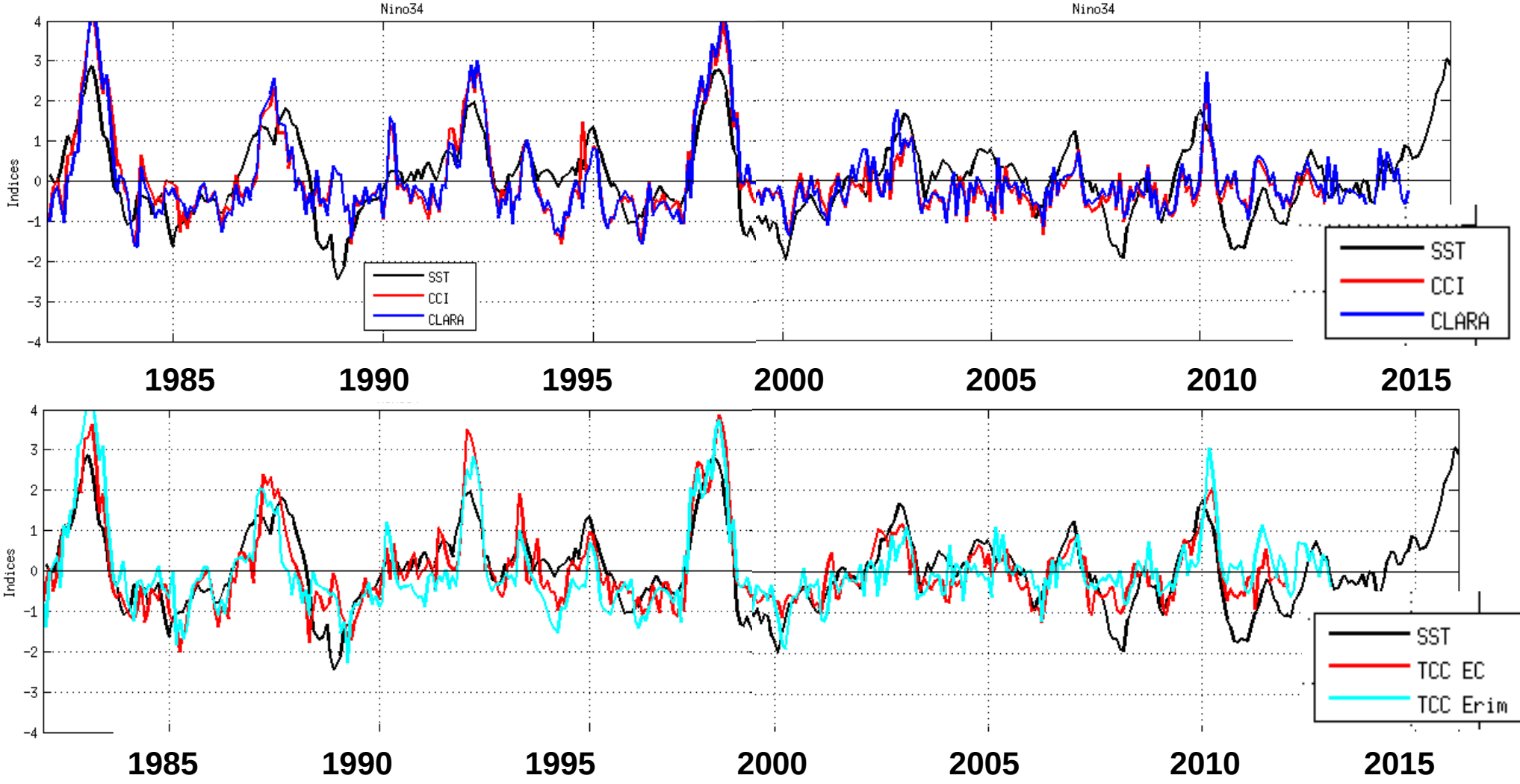
Nino3.4 SST (NOAA), Clouds(CCI and CLARA) and Sea level(CCI) indices: Index=Anomaly(X)/std(X)



Nino34 SST anomalies from http://www.cpc.ncep.noaa.gov/data/indices/sstoi.indices

WPO3.4 Cross-assessment of ECV's for global climate variability

Nino3.4: SST (NOAA), Clouds(CCI,CLARA top), (ERIM, EC-Earth bottom) level(CCI)



Conclusions

When evaluating climate models and/or processes

1a Use different types of observations for same ECV
Passive/active satellites, ground-based
1b Use interacting ECV's for process studies
Clouds-Soil moisture-**Precipitation**
Clouds-Aerosols-Radiation-**Temperature**

2 Use uncertainties

3 Know what you are comparing... and know assumptions in simulators
Directly
Simplistic Simulators/ observational proxies (spatial, temporal sampling)
Advanced Simulators, COSP (3D fields online)

4 Work together with data experts/ producers – Bridge the gap

CCI and CCI+

SMHI

Cross ECV interactions

SMHI

- Aerosol
- Cloud
- GHG
- O3
- SSH
- SST
- OC
- SI
- Fire
- LC
- Glaciers
- Ant. IS
- Arc. IS
- SM

WPO3.4 Cross assessment of of clouds, SM, aerosols, GHG, SST, water vapour ad radiation global climate variability and trends

SMHI

Timeseries, ENSO, IOD, 2D corr, scatterplots

Cross assessment observations, reanalysis and models. Investigate indices, process, co-varying variables.

SST Nino3.4 and Clouds 3.4 correlations

Strong signal for positive index...

OLR...