



Standardized Verification System for Long-Range Forecasts

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SVS for LRF: Goal

- *Provide verification information for Global Producing Centre (GPC) products used as inputs to seasonal forecasting processes, including RCOFs.*
- SVSLRF procedures targeted at providing information about quality of ensemble prediction systems (EPSs).

Long – Range Forecasts?

| | |
|---|---|
| Monthly outlook: | Description of averaged weather parameters expressed as departures from climate values for that month. |
| Three-month or 90-day 'rolling season' outlook: | Description of averaged weather parameters expressed as departures from climate values for that three-month or 90-day period. |
| Seasonal outlook: | Description of averaged weather parameters expressed as departures from climate values for that season. |

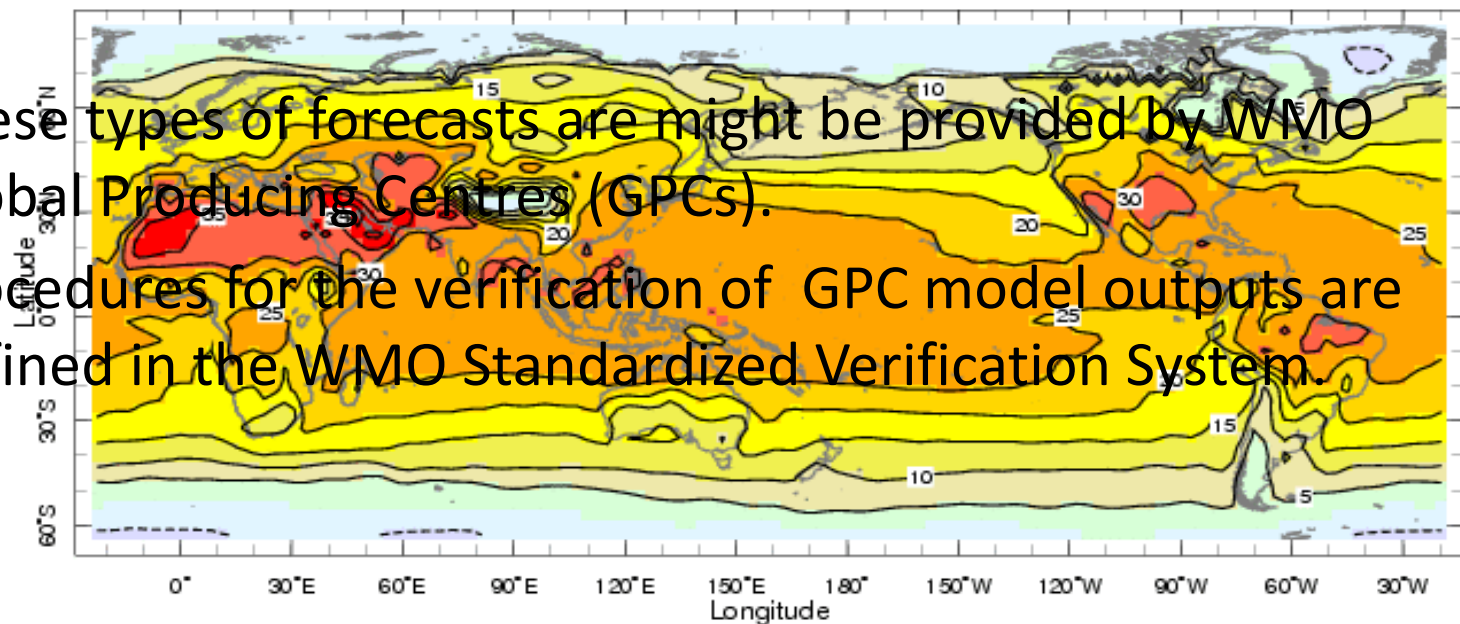
Seasonal forecast formats

Most seasonal forecasts are in one of two classes:

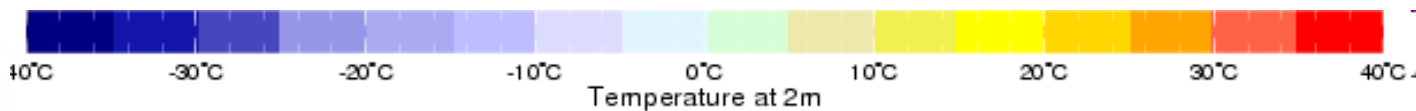
1. **A (set of) deterministic forecast(s) – outputs from a dynamical or statistical model.**

These types of forecasts are might be provided by WMO Global Producing Centres (GPCs).

Procedures for the verification of GPC model outputs are defined in the WMO Standardized Verification System.



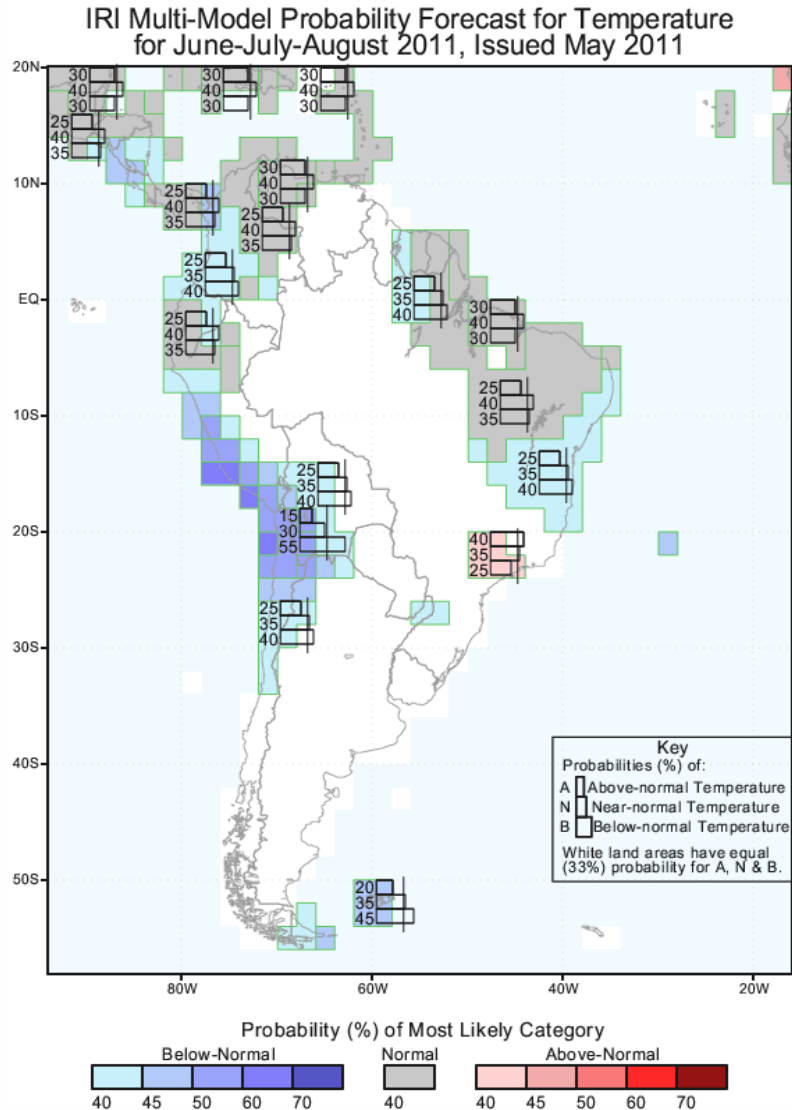
Jun-Aug 2010 IRI seasonal Forecast Temperature issued 0000 1 Jun 2010 from ECHAM4p5



Seasonal forecast formats

2. (a) Maps showing probabilities of the verification falling within one of two or more categories (by grid)

More specifically, for the SVSLRF, the probabilities are derived from calibrated (but not recalibrated) ensembles.



Lead Centre: Role

- The role of the Lead Centre is to facilitate the exchange of seasonal and longer range forecast verification results, as specified in the Standardised Verification System (SVS) for Long Range Forecasts (LRF) defined in the WMO Manual on the Global Data-Processing System (new [attachment II.8](#)).
- The Lead Centre will ensure that clear and concise information explaining the verification scores, graphics and data is available and maintained up-to-date on the SVSLRF website. Also, links to the participating Global Producing Centres will be listed on the site. The Lead Centre will provide and maintain software to calculate the verification scores, as well as recommended datasets for use in the assessments of the forecasts.

Lead Centre - Web Site

<http://www.bom.gov.au/wmo/lrfvs>

- Lead Centre web site is fully functional
- Contains Disclaimer, Documentation, Users Guide and Verification Maps
- As experts and potential users, we value your feedback
lrfvs@bom.gov.au



World Meteorological Organization
Lead Centre for the
Long Range Forecast Verification System

[Home](#) | [Contact](#)

[Disclaimer](#) | [Users Guide](#)
[Documentation](#) | [Verification Maps](#)

DISCLAIMER

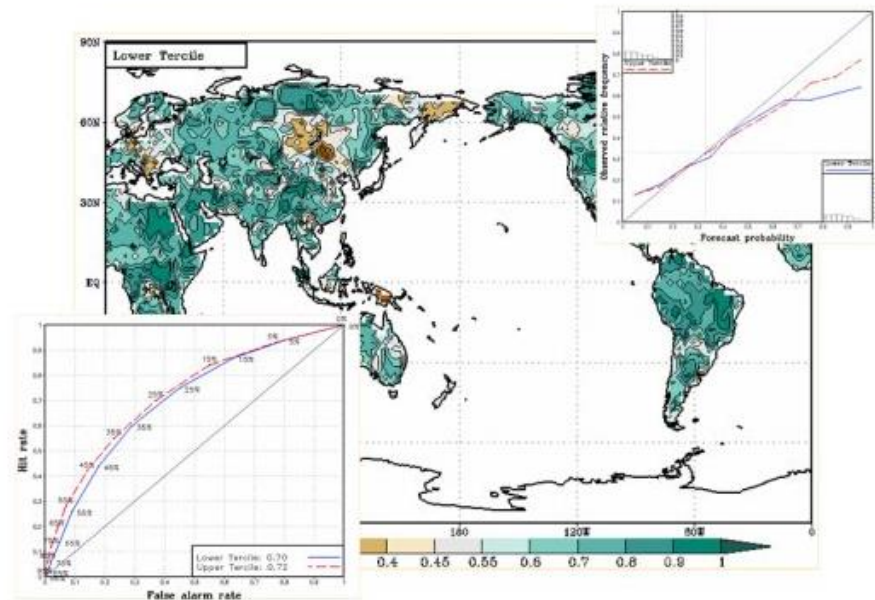
DOCUMENTATION

Participating Met. Agencies.
Lead Centre role.
Documentation and software.
Verifying datasets.
Submitting data.
Glossary.

USERS GUIDE

Variables to be assessed.
Levels of assessment.
Diagnostic measures.
What the Lead Centre provides.
How to submit results.
Format for submitting results.
Model system details.

VERIFICATION MAPS



The Lead Centre provides access to verification datasets, verifying software, documentation of the system, broad technical support, access to the final verification data as well as graphing and display of results.

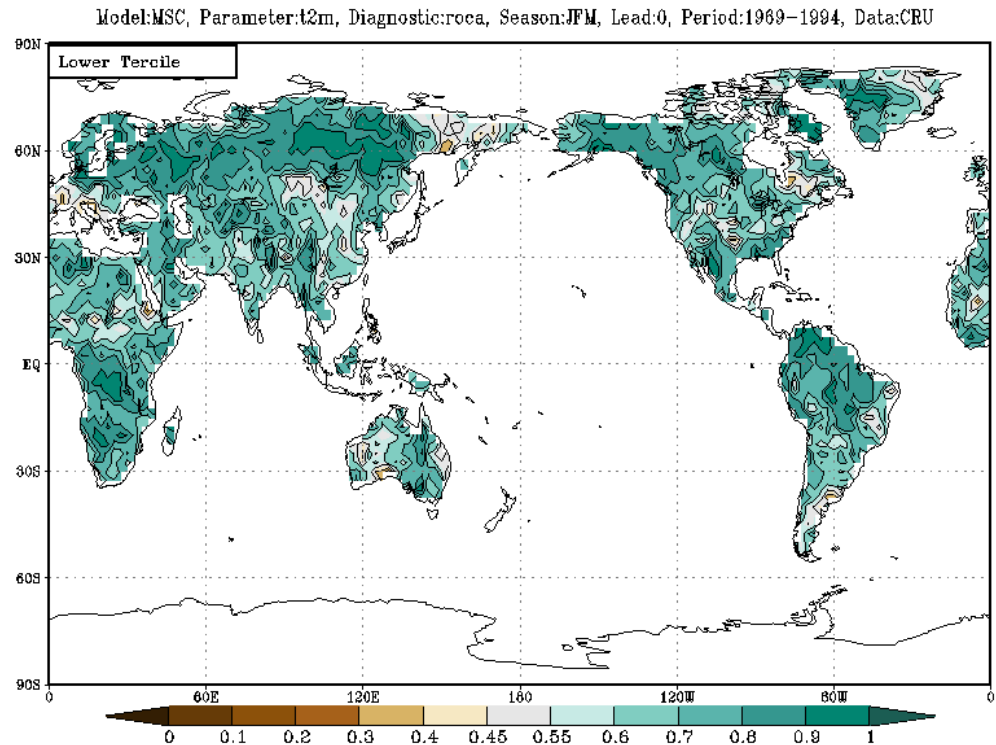
The [WMO](#) Lead Centre for the SVS-LRF is jointly managed by the [Australian Bureau of Meteorology](#) and the [Meteorological Service of Canada](#).

Current seasonal forecasts from Global Producing Centre (GPC) models will become available via the [Lead Centre for Long-Range Forecast Multi-Model Ensemble Prediction](#).

[home](#) | [contact](#)

Lead Centre: Data Presentation

- Series of Korn shell scripts, using “GrADS” (The COLA Grid Analysis and Display System) for displaying data
- GrADS was chosen due to its portability, ease of use, and as it is free and publicly available: <http://grads.iges.org/grads/grads.html> This means ease of relocation if the Lead Centre responsibilities changed hands.



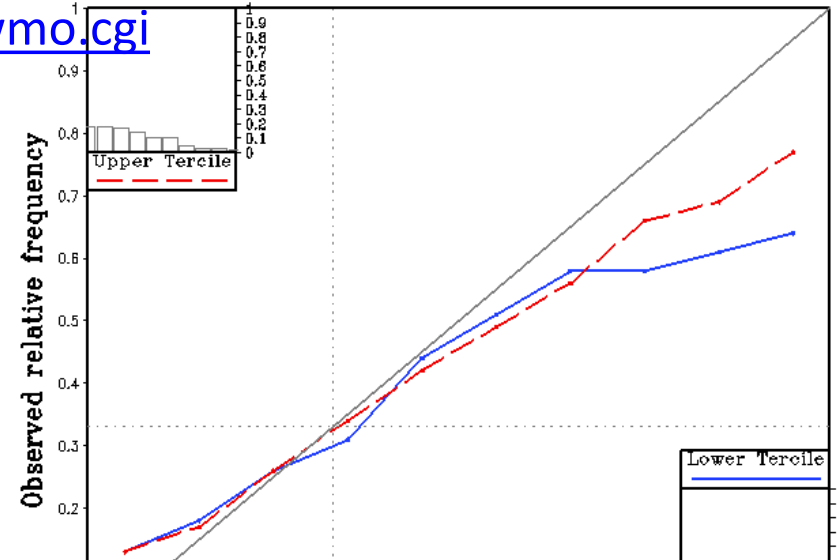
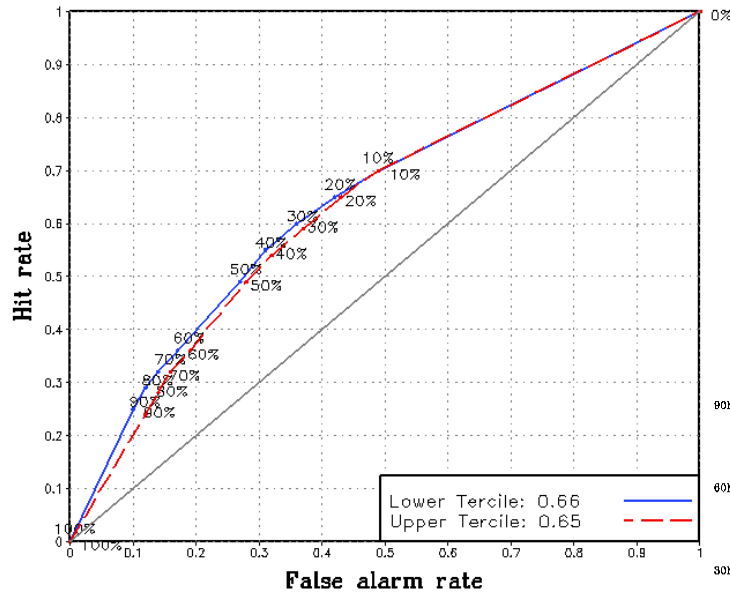
<http://www.bom.gov.au/wmo/lrfvs>

Examples of data presentation

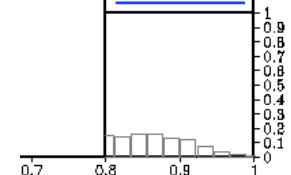
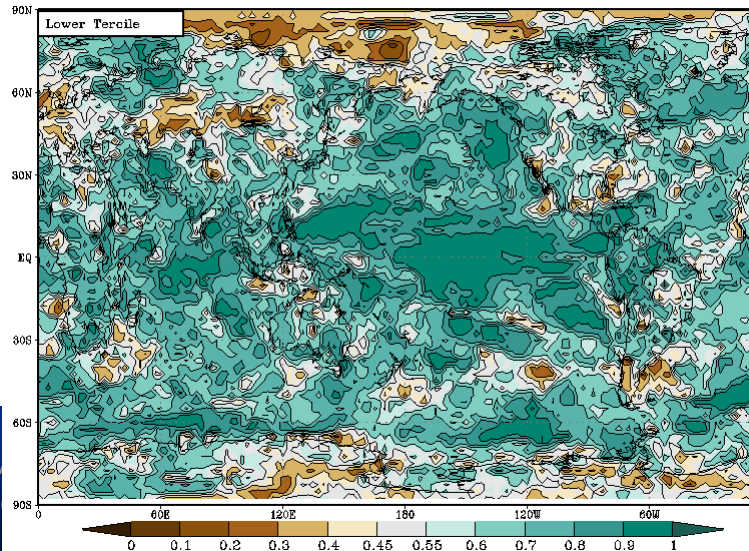
Model:MSC, Parameter:t2m, Area:t, Season:DJF, Lead:0, Period:1961-2001, Data:CRU2.1

<http://www.bom.gov.au/cgi-bin/climate/wmo.cgi>

Model:MSC, Parameter:t2m, Area:t, Season:DJF, Lead:0, Period:1969-1994, Data:CRU



ModelTest, Parameter:t2m, Diagnostic:roca, Season:JFM, Lead:1, Period:1967-2002, Data:ERA40



SVS for LRF: Parameters

- Regions addressed are
 - tropics between 20°N and 20°S
 - northern extra-tropics
 - southern extra-tropics
- Diagnostic measures delivered on three levels:
 - Level 1: Diagnostic measures aggregated over regions and for indices
 - Level 2: Diagnostic measures evaluated at individual grid-points
 - Level 3: Contingency tables provided for individual grid-points

SVS for LRF: Diagnostics

- ROC
- Mean Square Skill Score and decomposition

MSSS applicable to deterministic forecasts only
(ROC to deterministic and probabilistic forecasts).

MSSS applicable to non-categorical forecasts, i.e. forecasts of continuous variables (ROC to categorical forecasts).

- Reliability diagrams and frequency histograms
- Contingency Tables

Forecast Skill: MSSS

- The Mean Squared Skill Score measures skill in terms of a ratio between the Mean square error of deterministic forecasts and that of climatology.
- The MSSS is decomposed into:
 - Phase errors (through correlation)
 - Amplitude errors (through ratio forecast/observed variances)
 - Overall bias error of the forecasts

$$MSSS = 1 - \frac{\sum_j w_j MSE_j}{\sum_j w_j MSE_{cj}}$$

Summary

- The SVSLRF defines standards for the verification of GPC products.
- It has significant overlap with the CCI guidance, but is targeted specifically at the verification of Ensemble Prediction Systems, and so includes deterministic and probabilistic procedures.
- The Lead Centre hosts verification information presented in a standardised format to assist RCCs and NMHSs assess the quality of GPC products for their areas of interest. This information may be useful in the selection of GPC outputs for use in (statistical and/or dynamical) downscaling models.