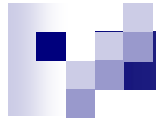


Seasonal Forecast using Statistical Model for Chile

Paola Uribe

Dirección Meteorológica de Chile



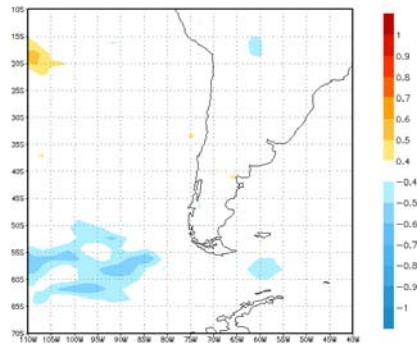
Outline

- Introduction
- Description of statistical model
- Validation
- Concluding remarks

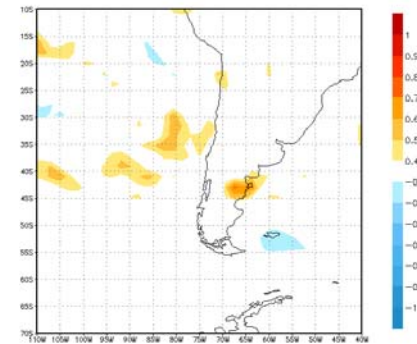


Correlation Patterns: Niño3.4 v Total Precipitation

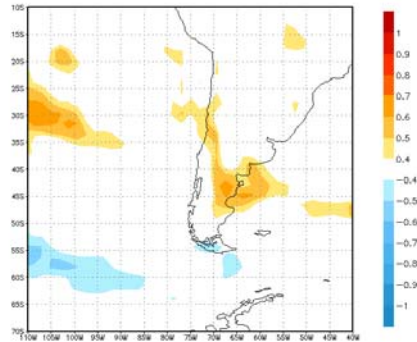
SUMMER



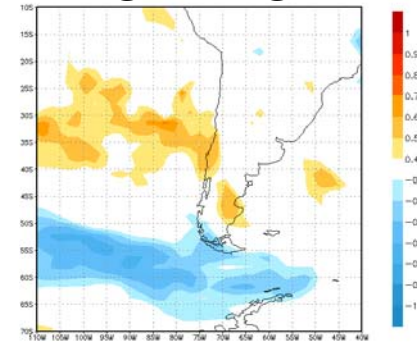
FALL



WINTER



SPRING



EL NIÑO 1997 - 1998



LA NIÑA 1998

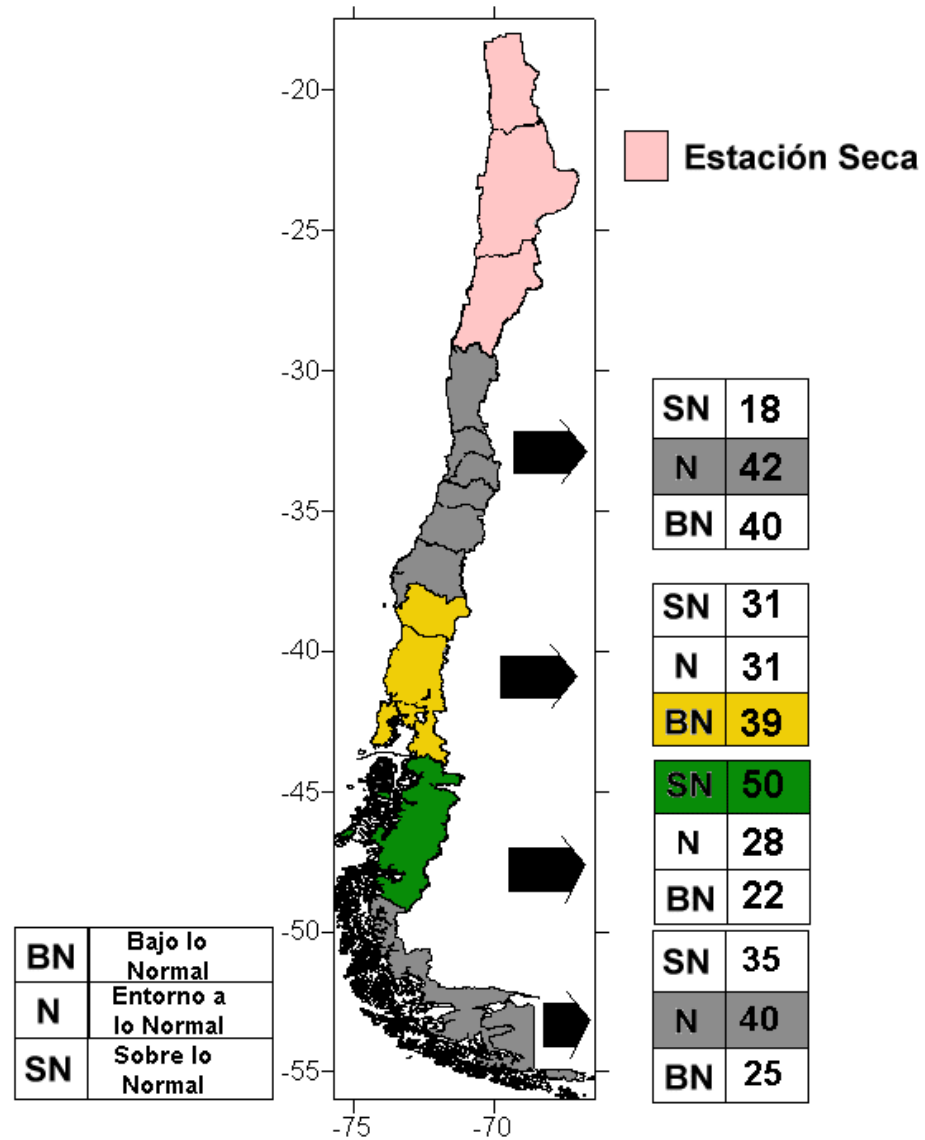




Statistical Model EXCEVER

- Office of Global Program from NOAA with cooperation of Costa Rica University and Atlantic Oceanographic and Meteorological Office from NOAA, developed a statistical model (EXCEVER).
 - Predictand: Sea Surface Temperature
 - Predictor: Seasonal precipitation
- Model used daily precipitation record from 1961 until now from different meteorological station along Chile

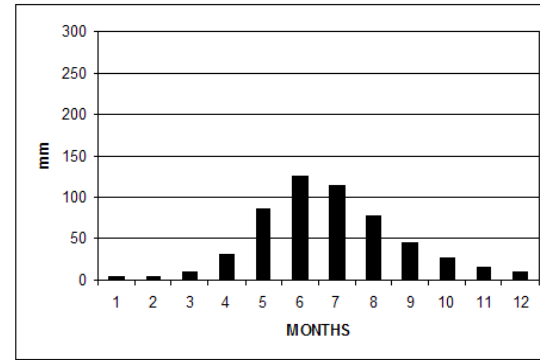
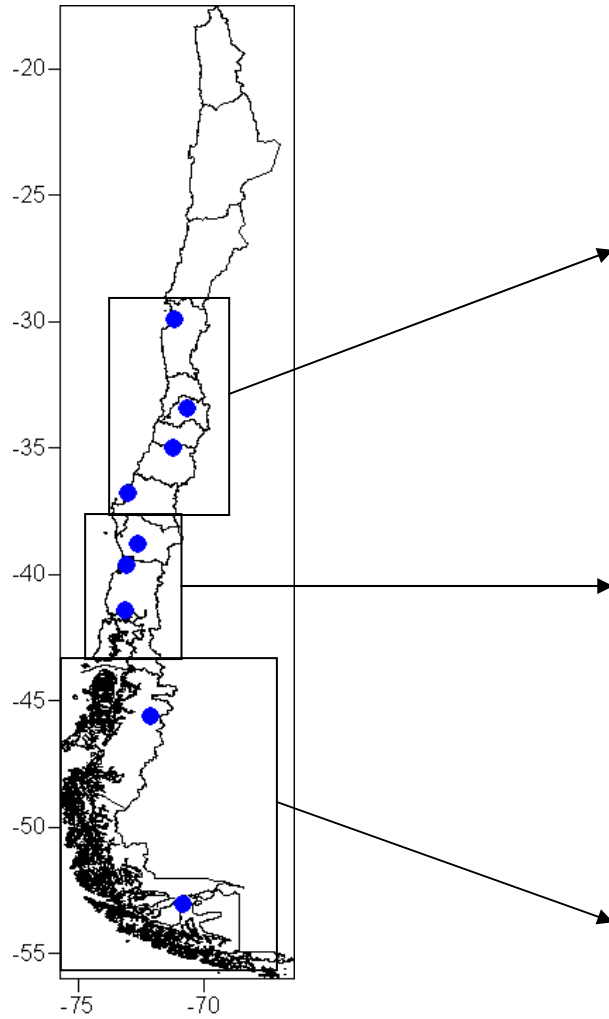
Probabilidad de Ocurrencia (%) de la Precipitación en Chile
Trimestre: ABRIL - MAYO- JUNIO 2005



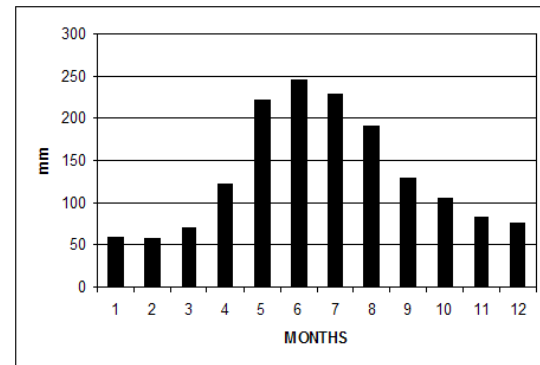
Fuente: Dirección Meteorológica de Chile



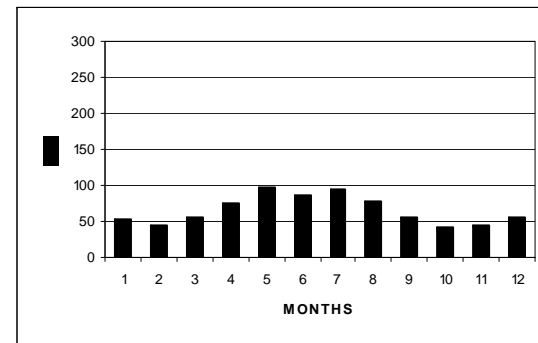
Validation



Region A



Region B

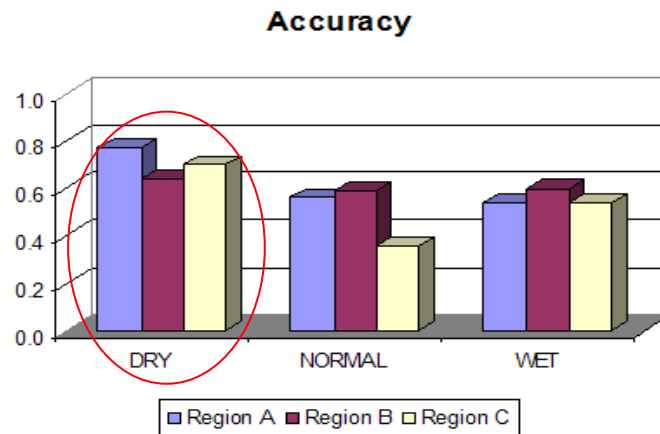


Region C

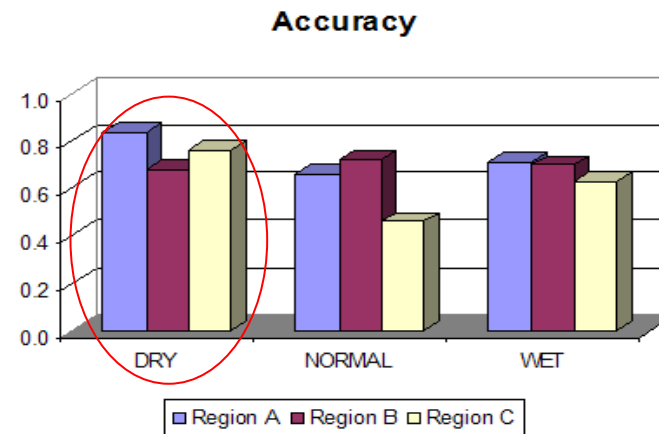
Accuracy

What fraction of the forecast were correct?

Model



Bulletin

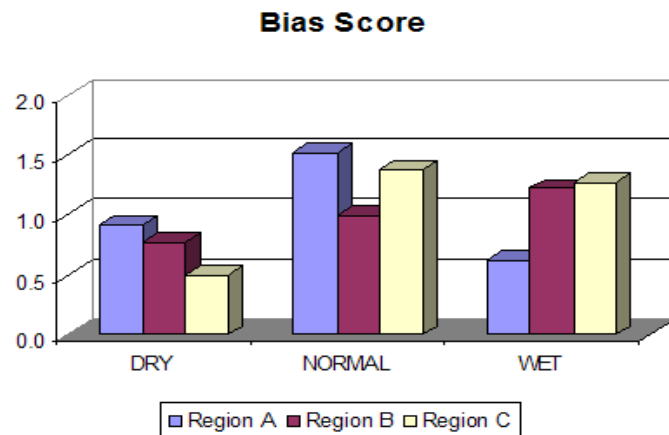


Results show over 70% correct for fry conditions at region A and the lowest score is for normal condition in region B.

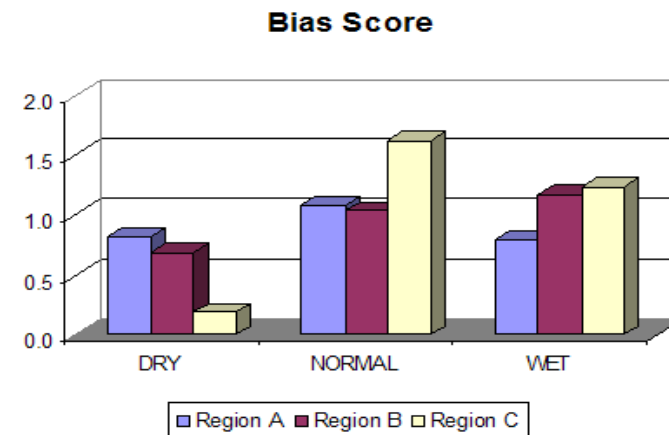
Bias Score

How did the forecast frequency of “yes” events compare to the observed frequency of “yes” events?

Model



Bulletin

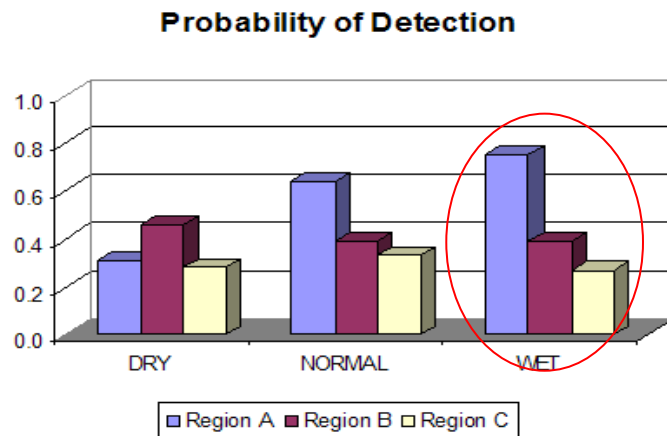


Bias is almost perfect for normal condition in region B. Slightly overforecasting of wet conditions at regions B and C. For dry conditions, an underforecasting is observed at regions B and C.

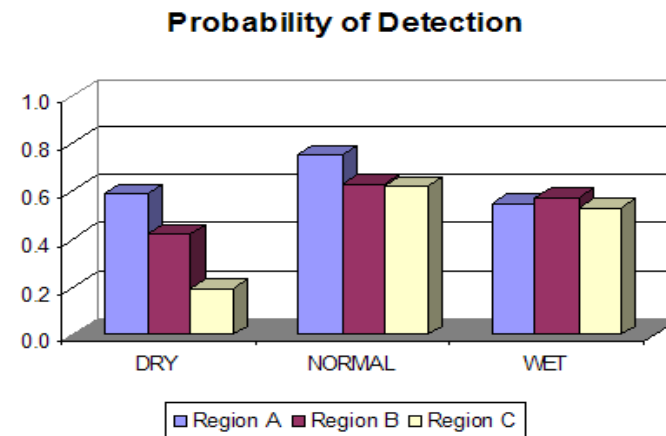
Probability of Detection (hit rate)

What fraction of the observed “yes” events were correctly forecast?

Model



Bulletin

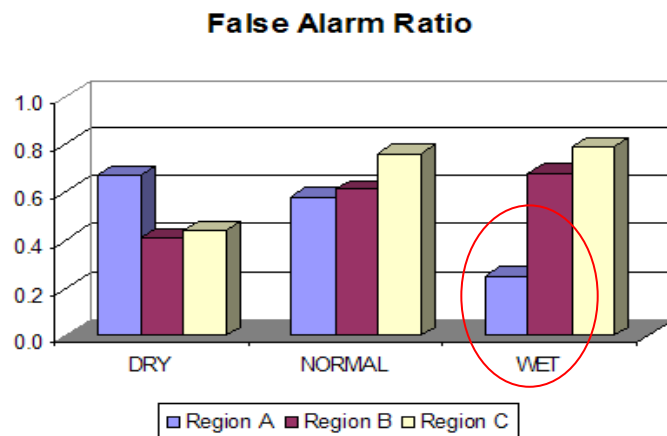


70% of wet conditions were correctly forecasted at region B (model). The lowest POD is for dry and wet conditions at region C.

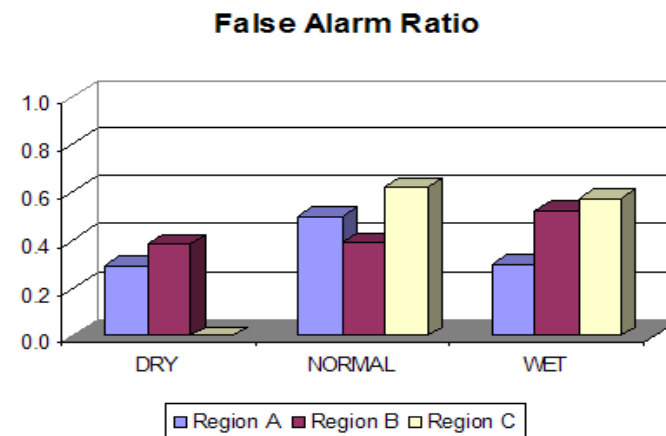
False Alarm Ratio

What fraction of the predicted “yes” events actually did not occur?

Model



Bulletin

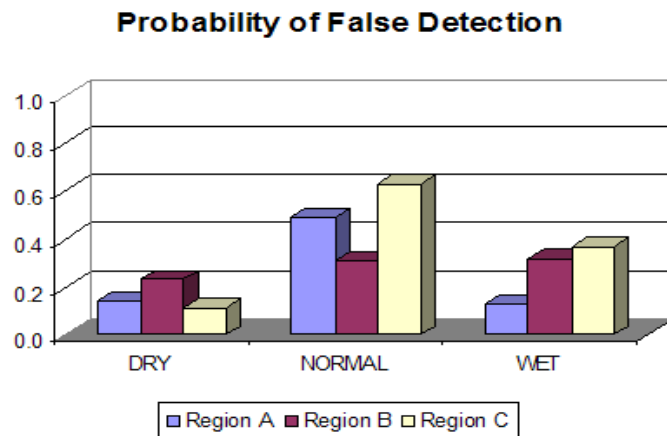


Lowest score for wet conditions at region A, which is consistent with the POD score. The highest score is for normal and wet conditions at region C.

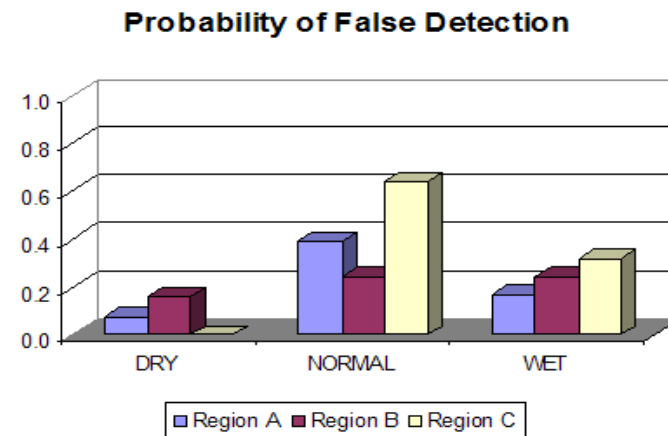
Probability of false detection

What fraction of the observed “no” events were incorrectly forecast as “yes”?

Model



Bulletin

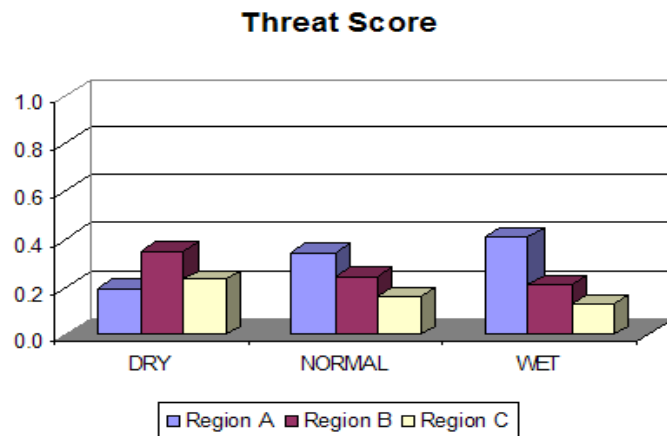


POFD shows that less than 15% of the observed cases for dry conditions at region A and C, the forecast were incorrect and 13% for the observed cases with wet conditions at region A. The lowest POFD is for observed normal conditions at region C.

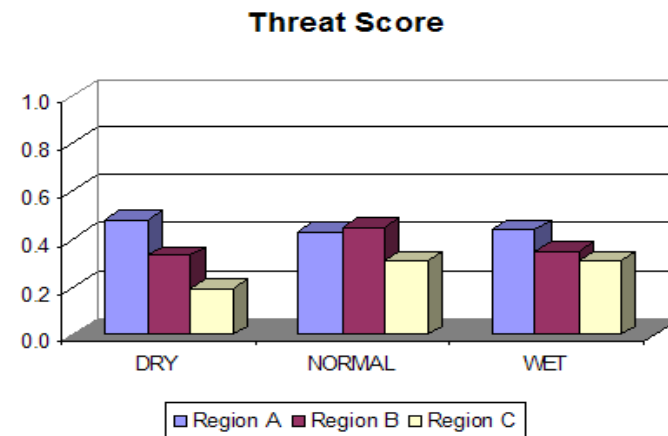
Threat Score

How well did the forecast “yes” events correspond to the observed “yes” events?

Model



Bulletin



The best TS is for wet conditions in region A. The lowest TS is observed at region C for normal and wet conditions.



Concluding Remarks

- Public Forecasting Bulletin presents the same results than the model but with better scores, so the expertise of the forecaster is very important.
- Validation results indicate:
 - Best accuracy to forecast wet and dry conditions in central part of Chile (region A).
 - The statistical model shows a good skill under El Niño and La Niña conditions, but for neutral conditions doesn't exist any relationship between ENSO and rainfall patterns in Chile.
 - The model doesn't show a skill to forecast any rainfall conditions over austral region 3, because doesn't exist any signal of ENSO over this region.