Climate forecasts are only one part of the whole story: combining seasonal forecasts with other types of climate information in agricultural decision-making

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This presentation…

- Focuses on the use of climate information in agricultural decision making
- Discusses the need for combining seasonal forecasts with other kinds of climate information
- Shows examples for agricultural production in the Argentine Pampas

The Argentine Pampas

- One of the main agricultural areas in the world
- Rain-fed production
- Large inter-annual climate variability
- Good soils that store a lot of water
- Crop yields tied to soil water and rainfall

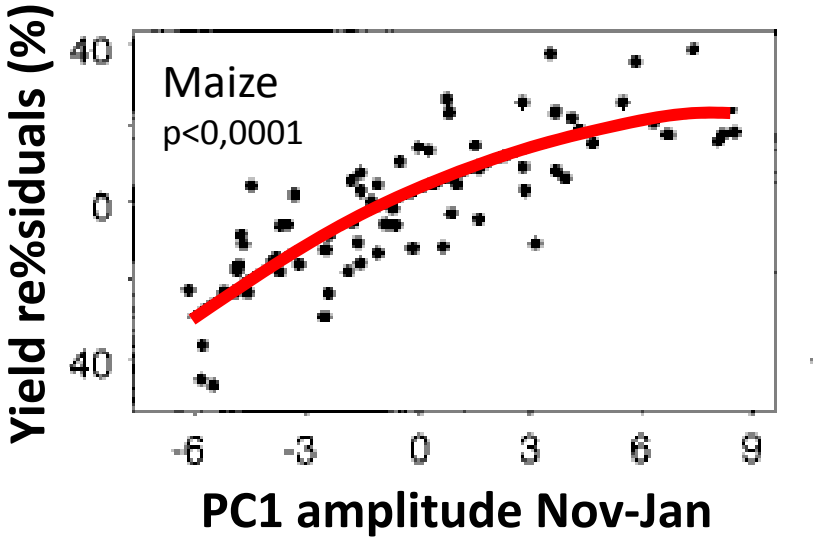


Figure adapted from Podestá et al. 1999

Climate information and decisions

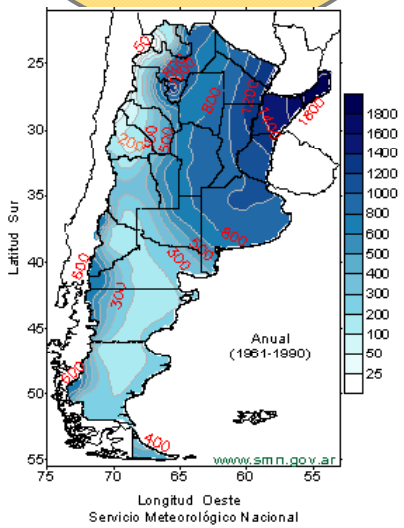
- Availability of water (soil + rainfall) main source of yields risk
- Farmers actively seek climate information… what do they use it for?
- They need to *anticipate availability of water* for the cropping cycle:
  - Narrow the range of likely outcomes → Business decisions
  - Adapt management to anticipated conditions → Agronomical decisions

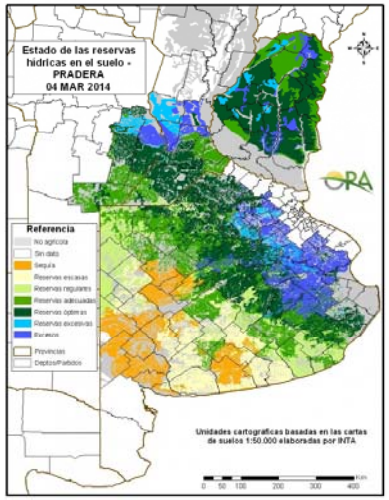
Kinds of climate information

Historical records

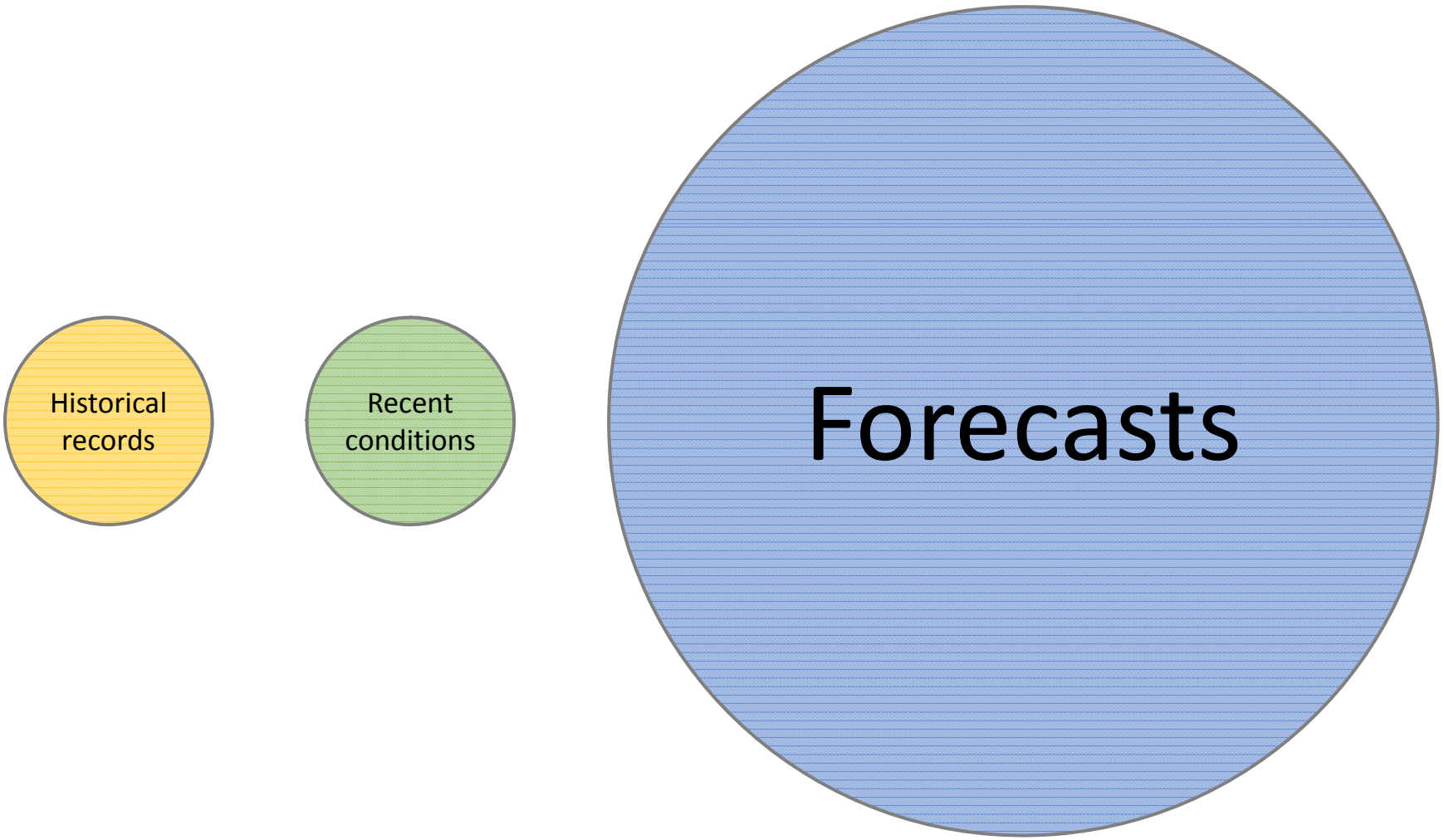
Recent conditions

Forecasts





Kinds of climate information



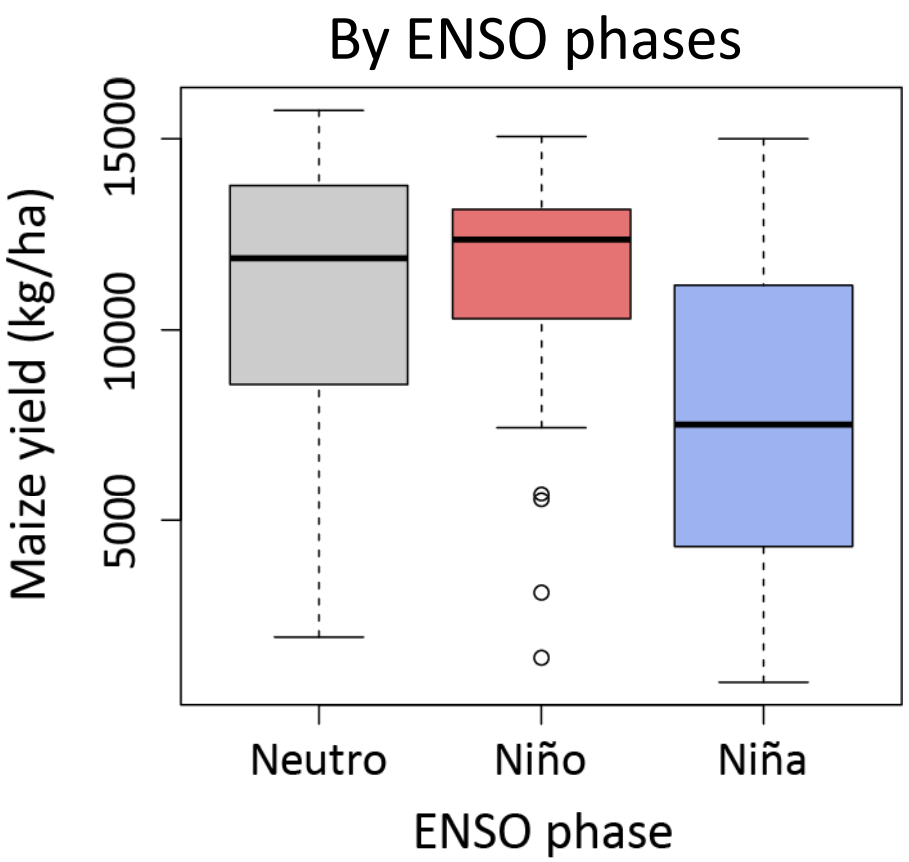
Exploring the contribution of climate information

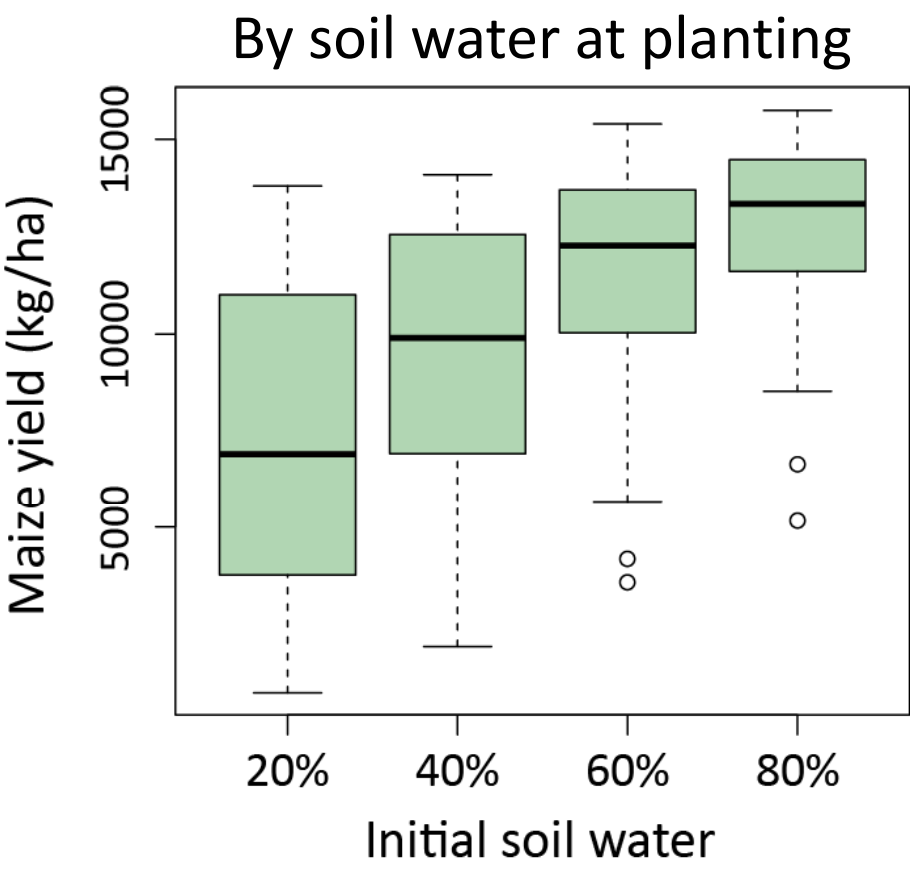
- Simulation of maize and soybean yields in multiple locations of the Pampas using DSSAT:
  - Historical climate records discriminating ENSO phases
  - Range of initial soil water contents
  - Set of realistic agronomic managements

*This presentation shows results only for selected cases which illustrate relevant concepts

Likely outcomes: ENSO phases and soil water

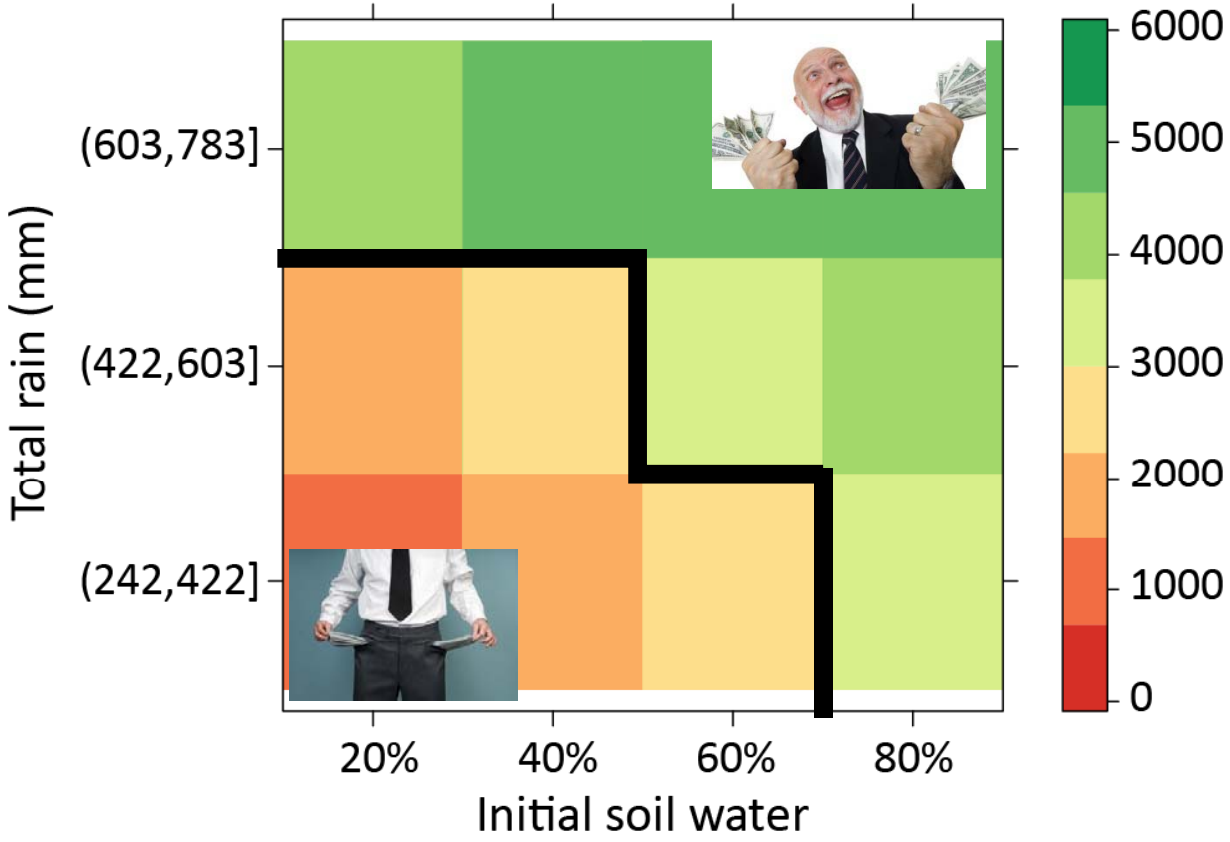
- Maize yields in Pilar





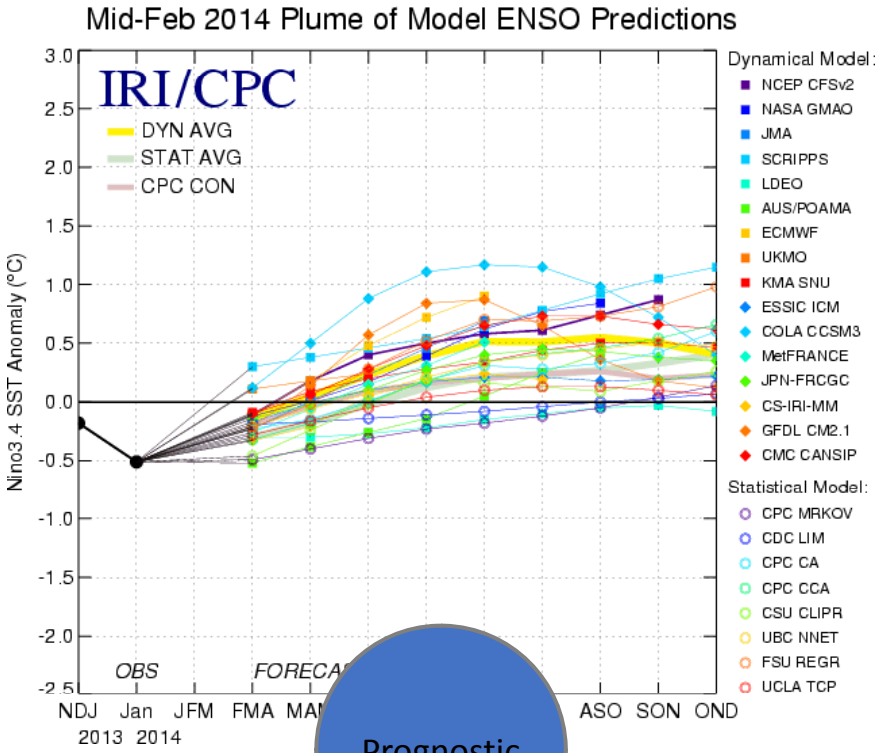
Likely outcomes: interactions between ENSO phases and soil water

- Soybean in Pilar

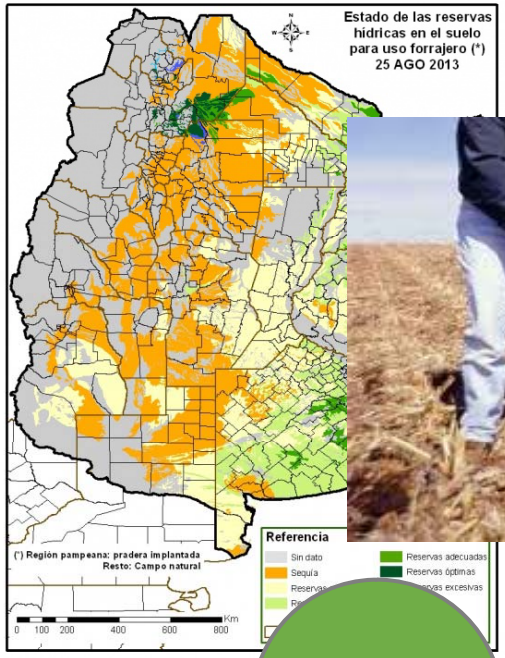


Likely outcomes for ENSO phases and soil water

- Uncertainty of information



Prognostic



Diagnostic

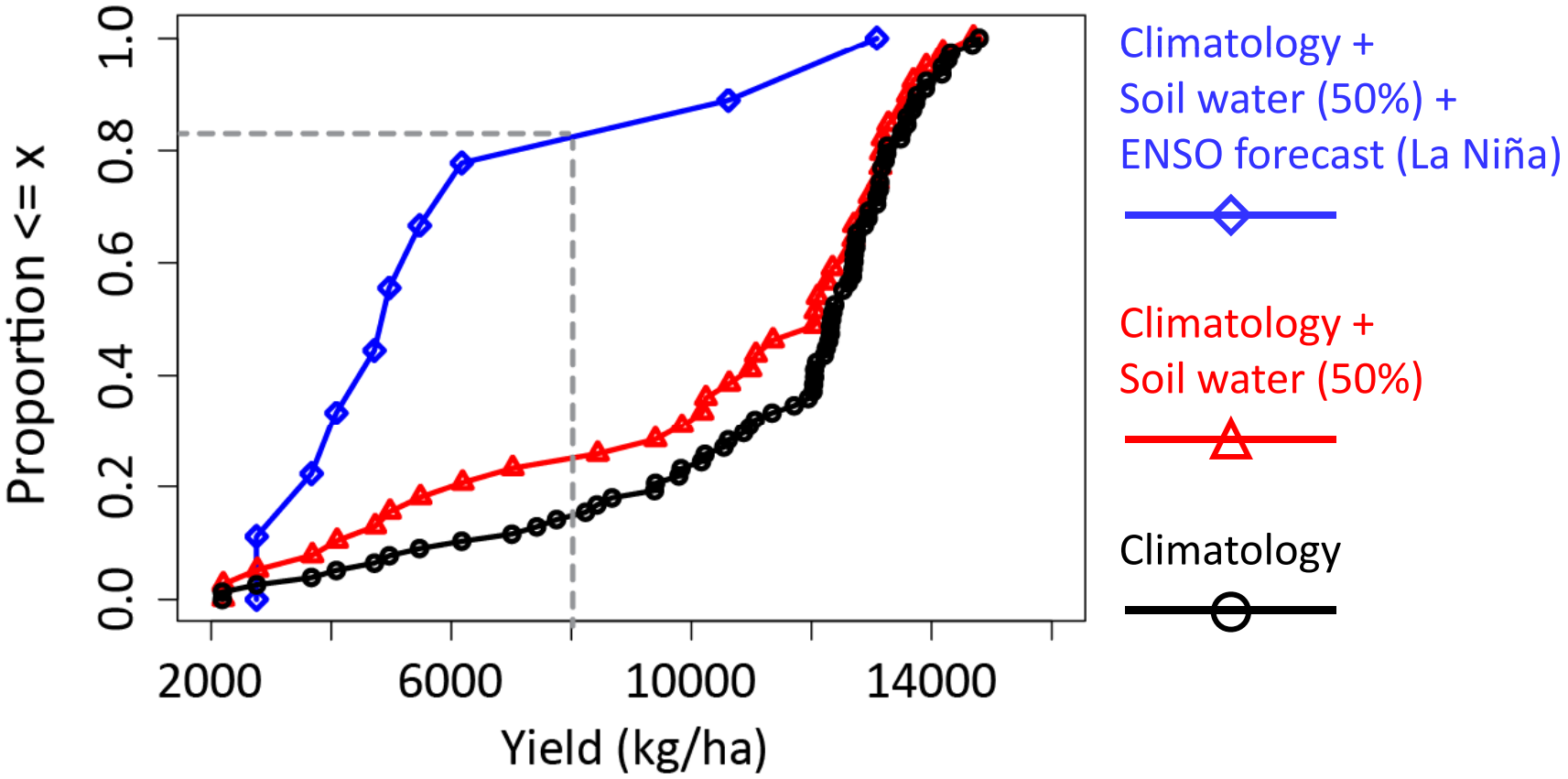
Agronomic management: ENSO phases and soil water

- Maize in Junín: Median yields and interquartile range (IQR) for two agronomic managements

Initial soil water	ENSO Phase	Early sowing + fertilizer		Late sowing - fertilizer	
		Median	IQR	Median	IQR
50%	Neutro	10,047	6,135	10,202	3,065
	Niña	2,971	1,572	9,835	4,480
	Niño	11,377	6,705	10,294	2,414
100%	Neutro	12,452	2,509	10,769	2,916
	Niña	6,047	2,404	11,045	5,088
	Niño	12,298	2,472	10,208	1,098

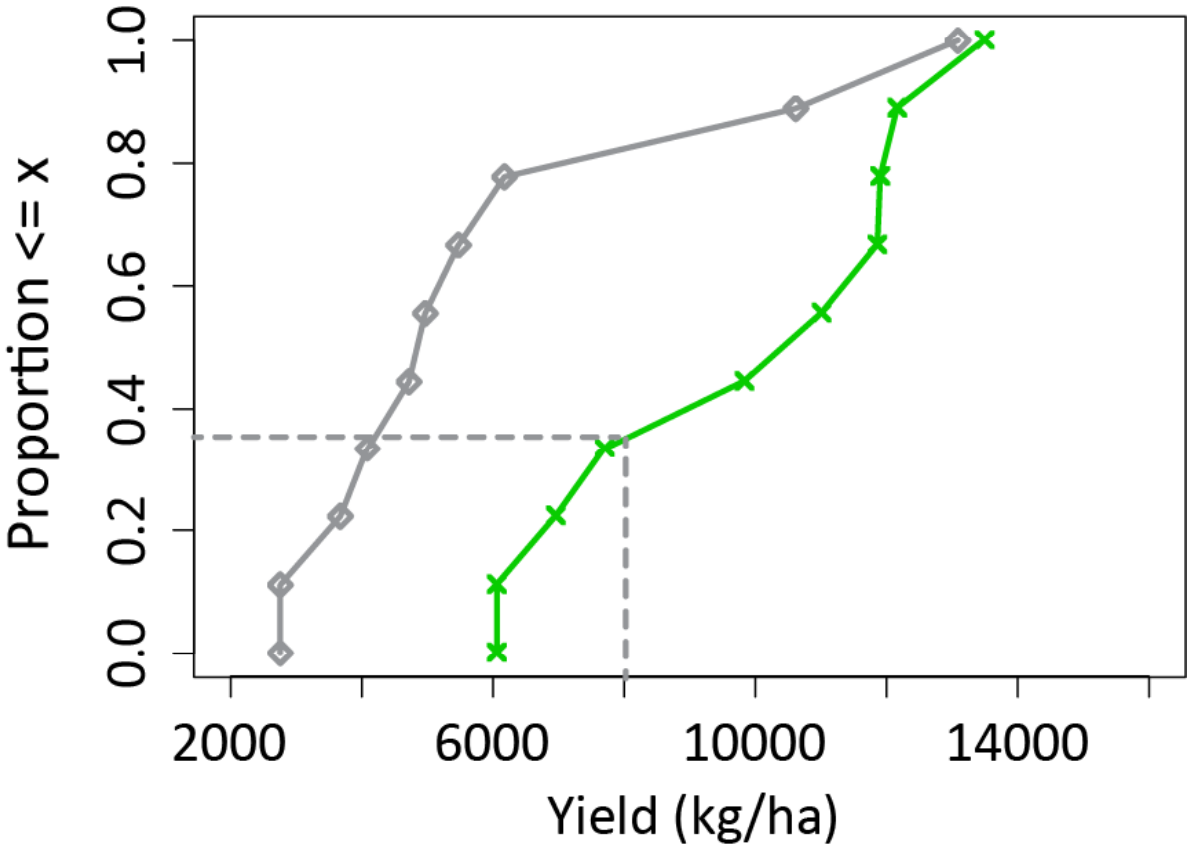
Combining kinds of climate information

- Narrow the range of likely outcomes – Early sowing of maize in Junín



Combining kinds of climate information

- Adapt management to anticipated conditions - Maize in Junín

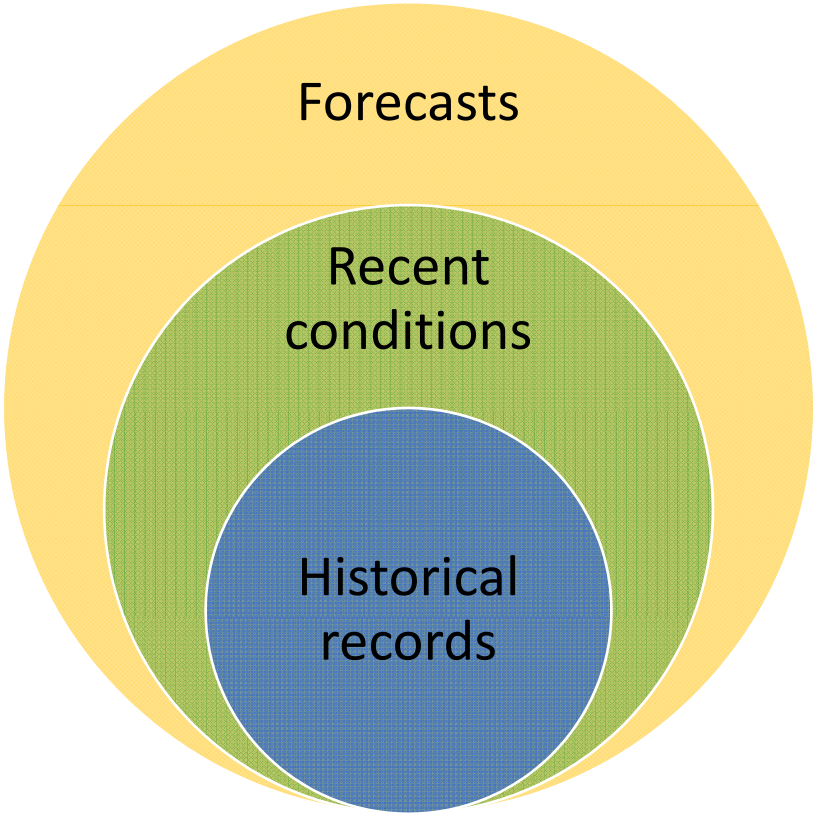


Climatology +
Soil water (50%) +
ENSO forecast (La Niña)

Adapted management
(Late sowing)

Conclusions

- Climate forecasts are only one part of the whole story…
- We need to produce and deliver different kinds of climate information and foster its combined use

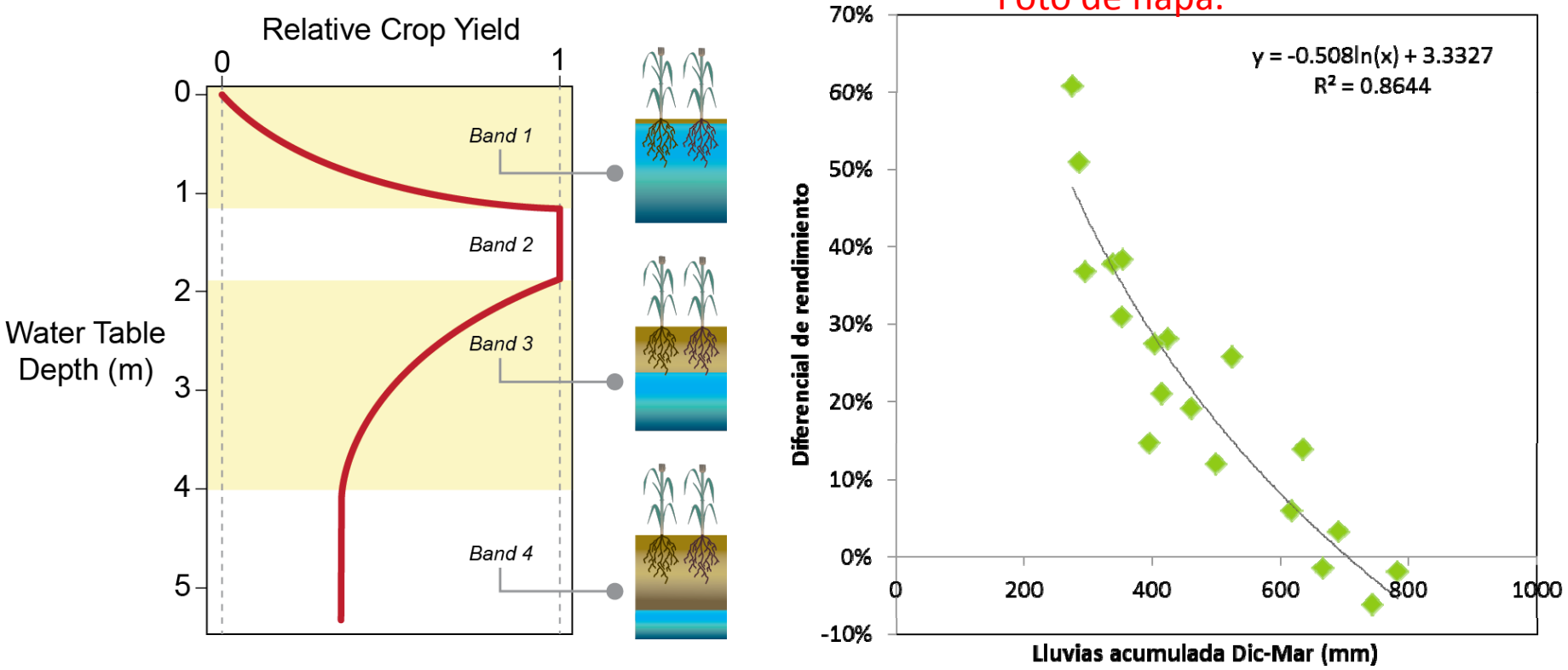


- Muchas gracias!
- Federico Bert

The obvious(?) case

- Water table and crop yields:

Con napa y sin napa.
Foto de napa.



Left: Adapted from Nosetto et al. 2009. Rigth: Analysis of soybean field outcomes in the Zona Centro of AACREA. Courtesy of G. Martini.