

Climate Information, Data Logistics, and the Enhancement of Decision Systems

By
M. Neil Ward
and
C. F. Ropelewski



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Institutions and Policies Research

- Methodologies for mapping institutions and policy process
- Methodologies to analyze policy responses and development outcomes
- Methodologies to analyze institutional utility of climate information

Examples illustrating efforts aimed at developing Climate Risk Management Tools

- Health
- Agriculture
- Financial Tools

Example 1 - Health

Epidemic Preparedness and Response (EPR)

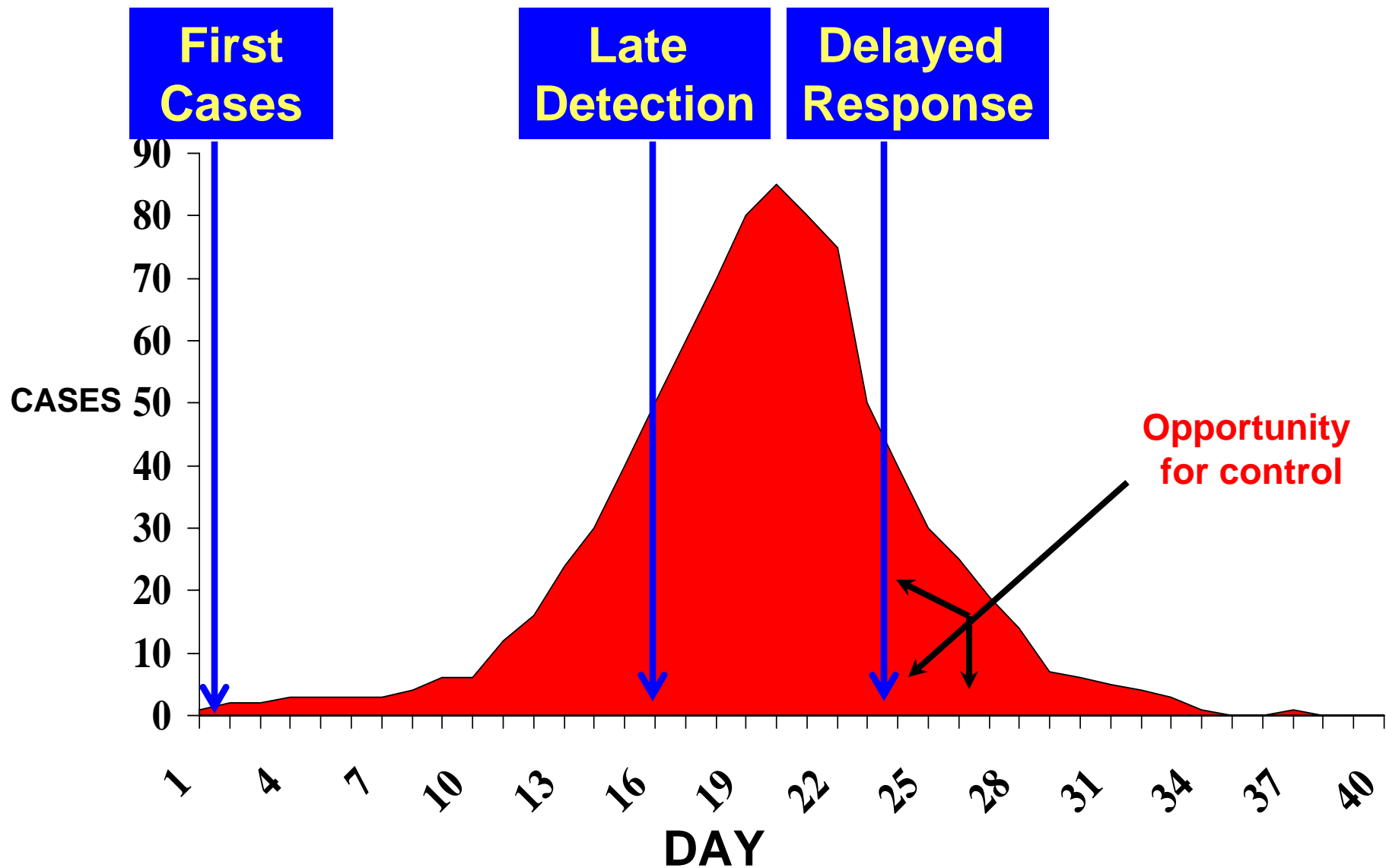
An example of how climate information can influence decisions in a real-world setting.

Malaria Surveillance, Forecasting, Preparedness and Response in Southern Africa

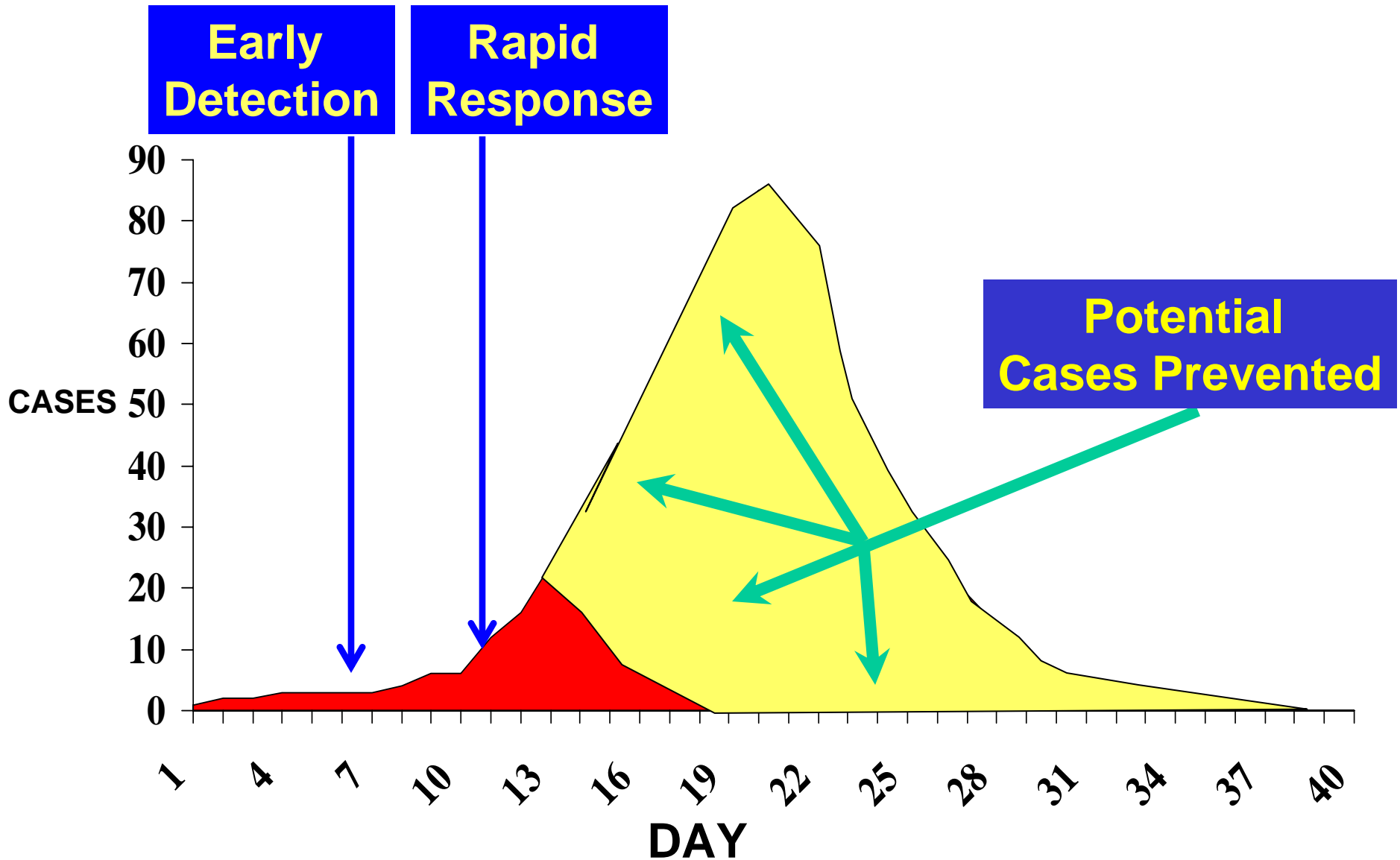
Coordinating authors:
 Silem M. Luchessa, Victoria M. Jorgensen, Debra M. Colwell, and
 Joseph D. Sacks, colwell@umich.edu



Why EPR Planning: **Outbreak Detection and Response Without Preparedness**



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Environmental monitoring

Example in Botswana ...

ENV monitoring enables opportunities to mobilize more localized response >>





..... Seasonal Forecasting

SCF offers opportunities for planning and preparedness

NMCP strengthen vector control measures and prepare emergency containers with mobile treatment centers



Example 2 – Agriculture

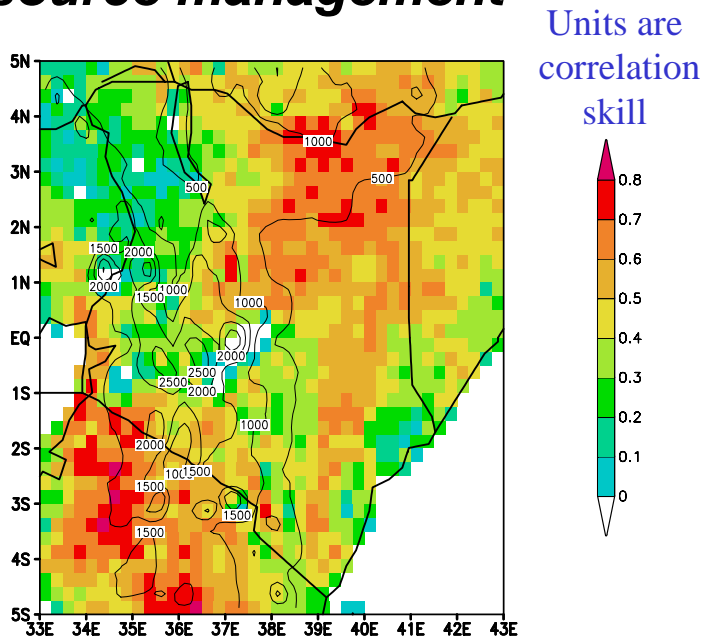
Using climate information to inform decisions in agriculture.

Transforming forecasts to a widely used variable in resource management

Statistical Downscaling to NDVI

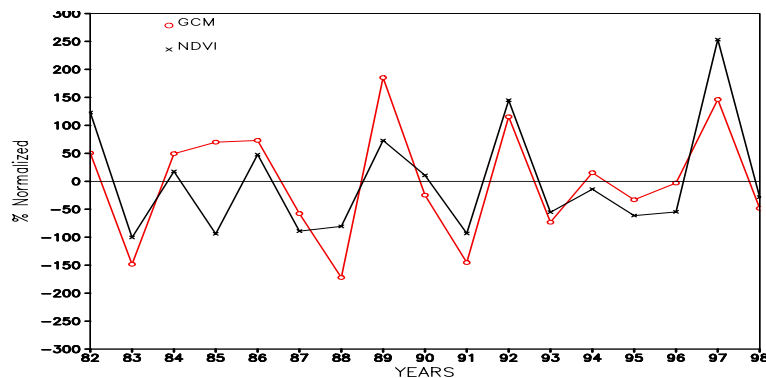
Using a GCM with Sept SST to predict December vegetation across East Africa 1982-1998

Spatial variations in skill may reflect
 -variations in climate predictability
 -variations in climate-NDVI coupling



Contours are elevation

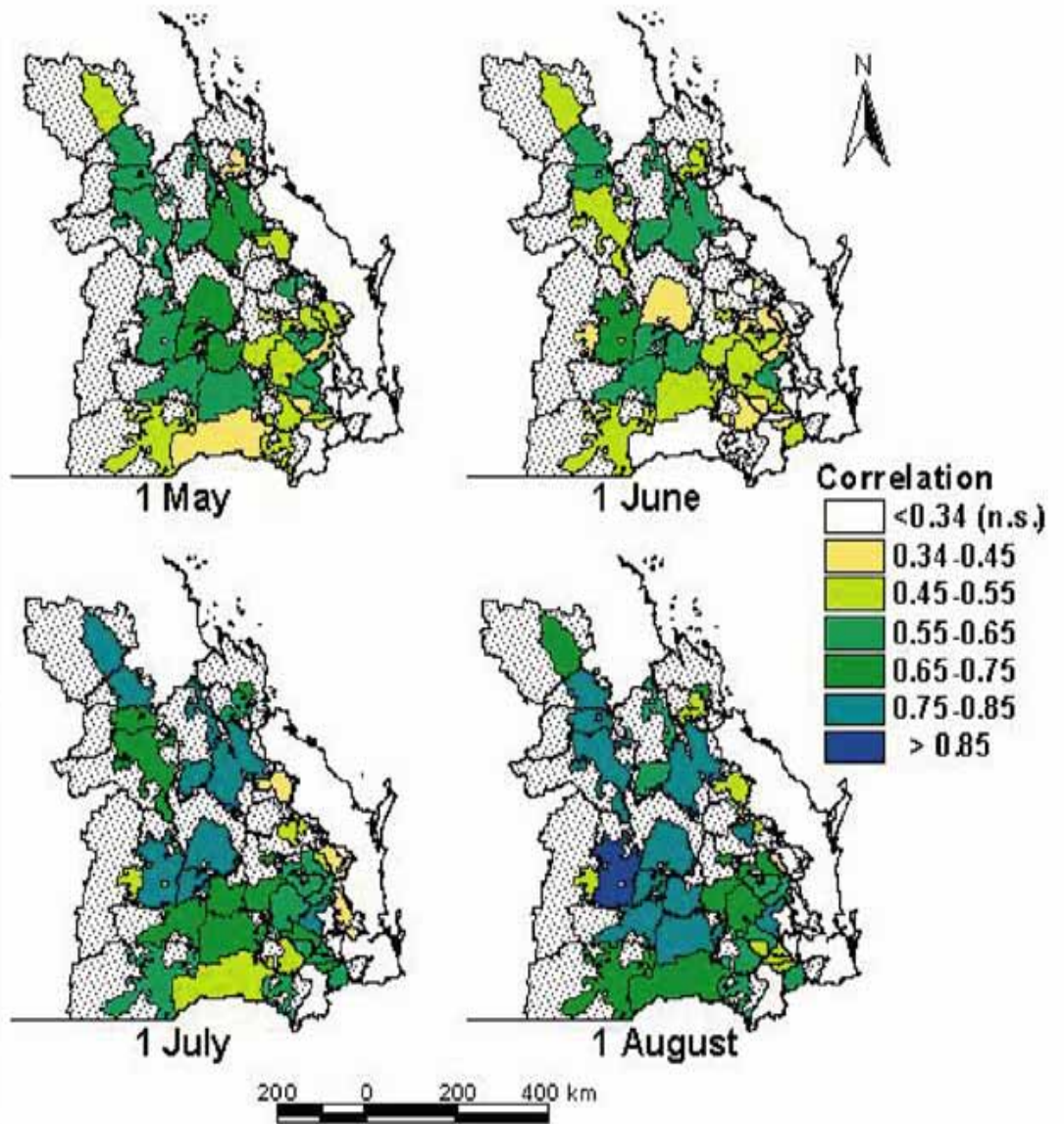
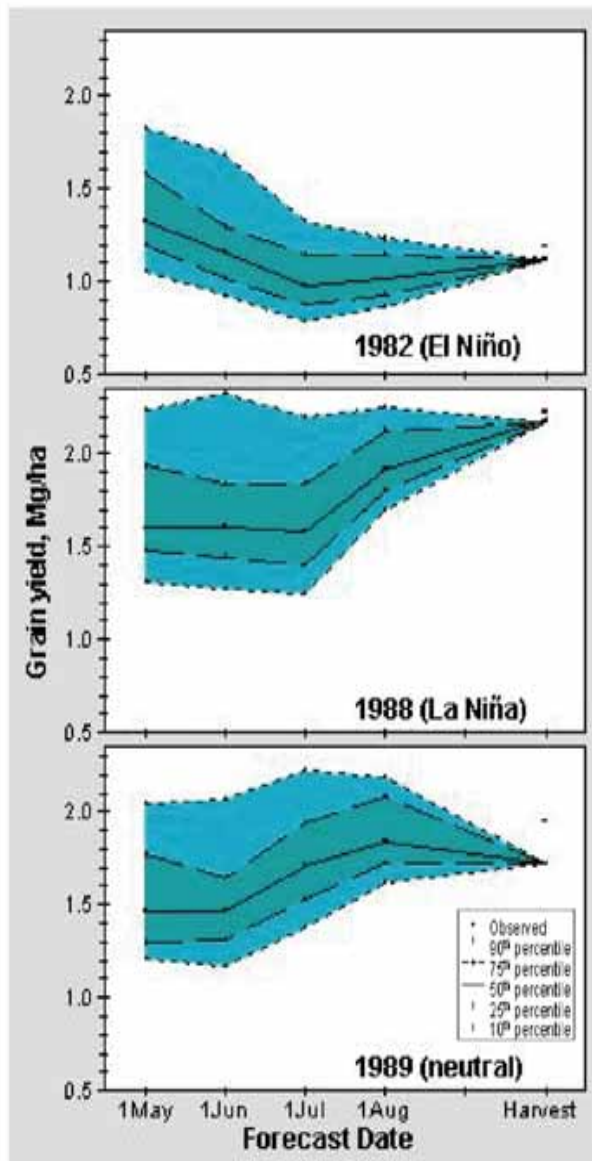
Corrected high resolution NDVI provide by USGS



Time series of area-average predicted and observed NDVI over NE Kenya ($r=0.76$)

(Indeje et al, 2006, in press)

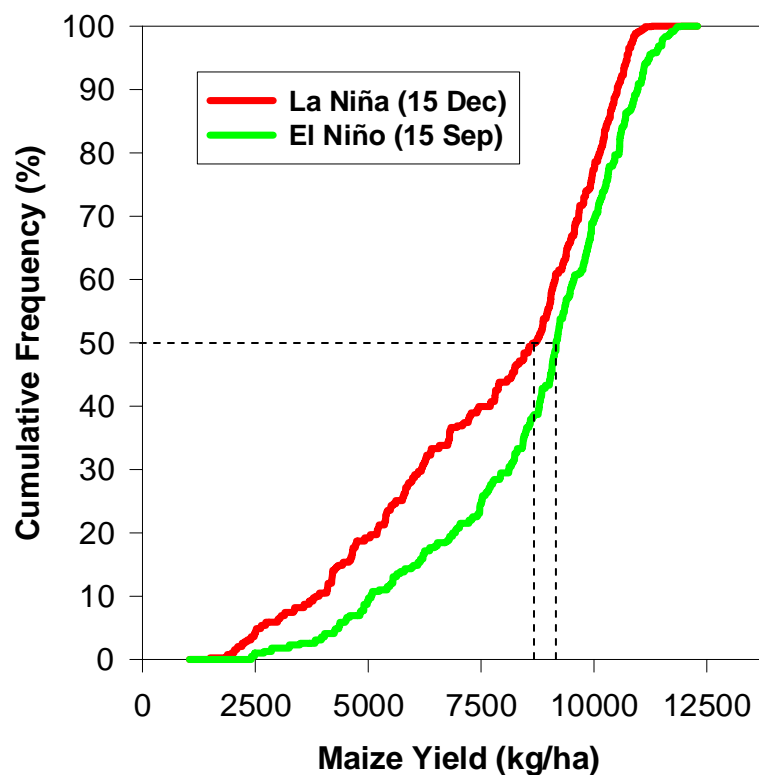
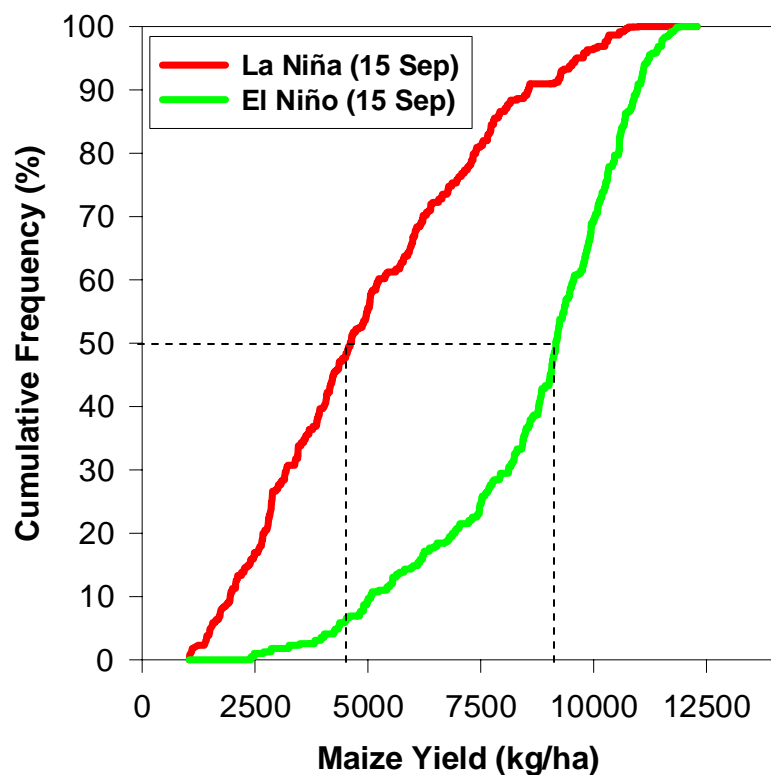




Exploring farmers responses, changing decisions

Adjusting crop management practices to ENSO phases

Maize: Changing sowing date and hybrid type
La Niña years: shorter season hybrid, late sowing date



Index insurance

- Insurance is a key tool to allow use of information in decisionmaking
- Problems with traditional crop insurance
 - Moral hazard
 - Adverse selection
- The index innovation
 - Insure weather index (such as seasonal rainfall), not crop
 - Only partial protection (basis risk), should not overuse
 - Cheap, easy to implement, good incentives
- Minimum possible price (easy to determine):
 - average insurance payout + admin + risk finance costs
 - This price must $<$ value to client for market to exist

Summary of current activities in Africa

- **Ethiopia**
 - Drought famine relief (client: national government, pilot 2006)
 - Crop loss micro-insurance (client: farmers, pilot 2006)
- **Morocco**
 - Crop loss micro-insurance, climate change problems
- **South Africa: Relatively developed financial markets**
 - Apple grower cooperatives and freeze coverage
- **Malawi**
 - Drought relief (client: national government, pilot 2006)
 - Farm level crop loss, bundled contracts (~900 farmers, transacted 2005)
- **Scoping: Tanzania, Uganda, Kenya, more on the way**
- **India: BASIX, thousands of farmer transactions completed World Bank CRMG, Re-insurers, WFP highly involved**

Index Insurance, Production Practices, and Probabilistic Climate Forecasts (Dan Osgood and Miguel Carriquiry)

Current research directions on the use of financial instruments.

“...Since the fundamental relationship between insurance, input use, and seasonal climate forecasts has not been addressed, we propose to fill this gap by explicitly modeling input use and index insurance demand given probabilistic seasonal climate forecasts. ...”

“...We will derive optimal input and insurance demand as a function of forecast quality and determine production changes with respect to the availability of forecast information and insurance and study the potential for using insurance markets to signal forecast information to farmers and to reveal the value of forecasts.”

From 2006 American Agricultural Economics Association meeting abstract



SUMMARY

Climate Risk Management provides:

More resilient **systems for management of seasonal climate variability.**

and

A mechanism for building management systems to cope with climate variability on longer time scales

Tailoring climate information to risk management problems is key methodological issue

Early and effective engagement with stakeholders is essential

For most effective and timely implementation, **institutional mapping** is key