Applications of global seasonal forecasts

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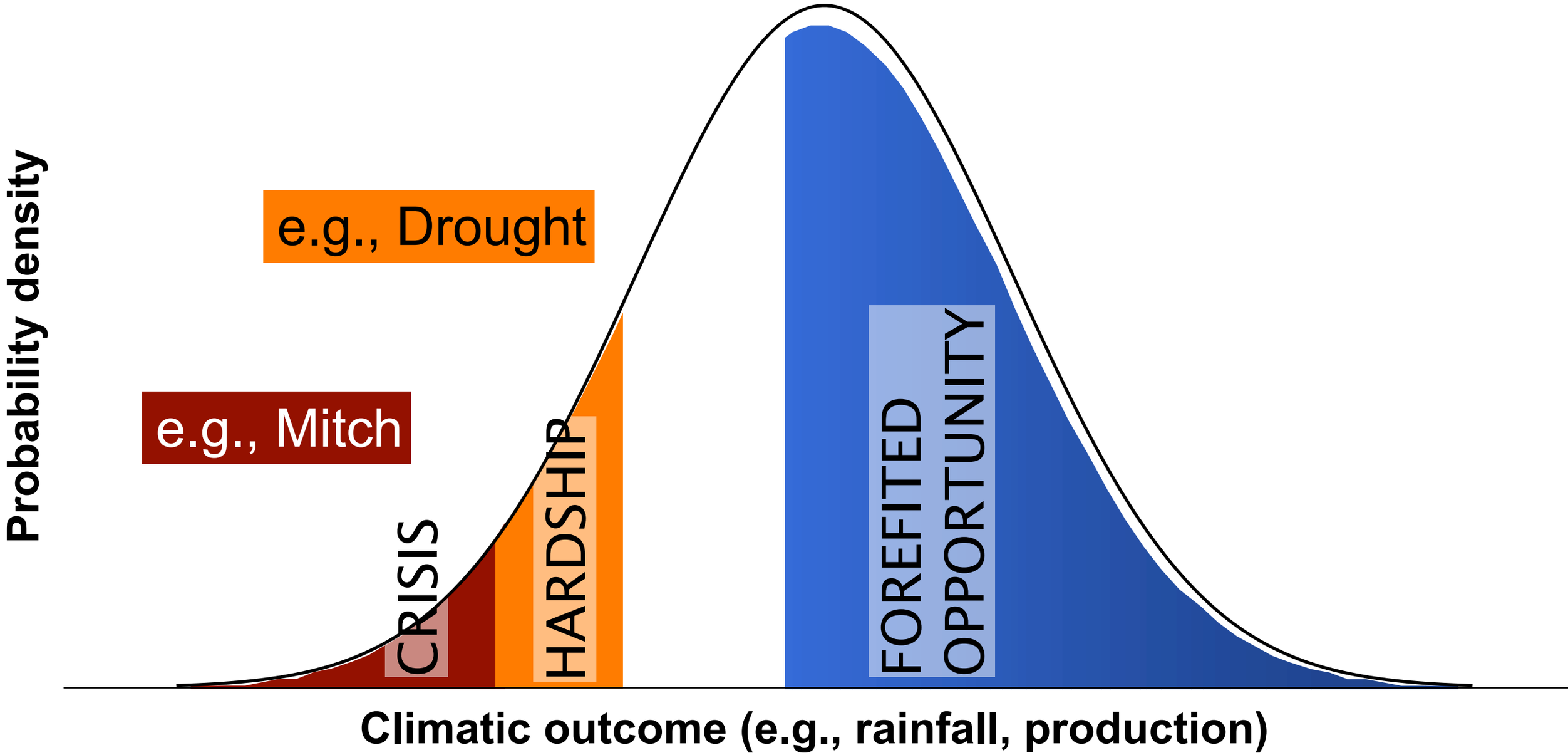
Climate Risk Management: the Full Range of Variability



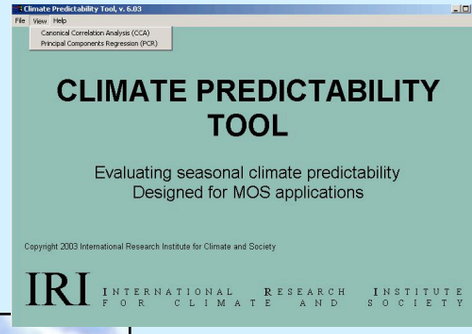
Examples

- Water resource management – Manilla, Philippines
- Humanitarian aid – Red Cross/Red Crescent

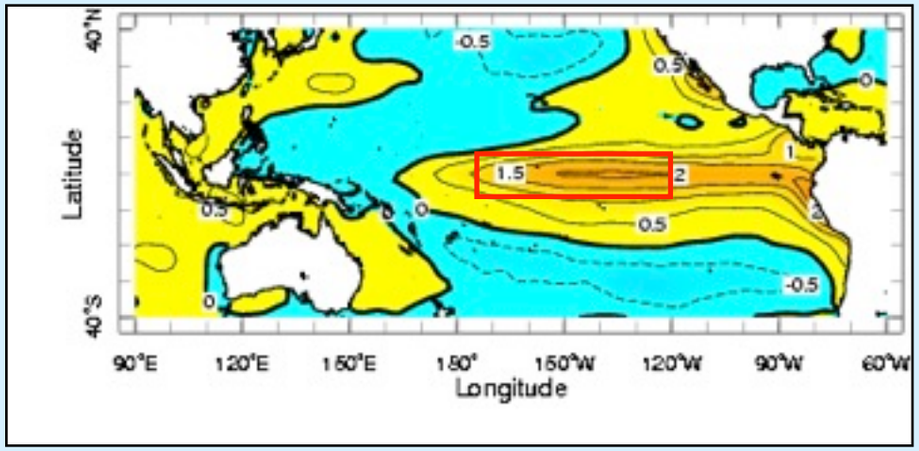
The Angat Reservoir, Philippines

- Built in 1968
- Competing uses
  - Manila's drinking water
  - Electricity generation
  - Irrigation
  - Flood control
- Complex allocation system

Downscaling for Philippines Reservoir Inflow

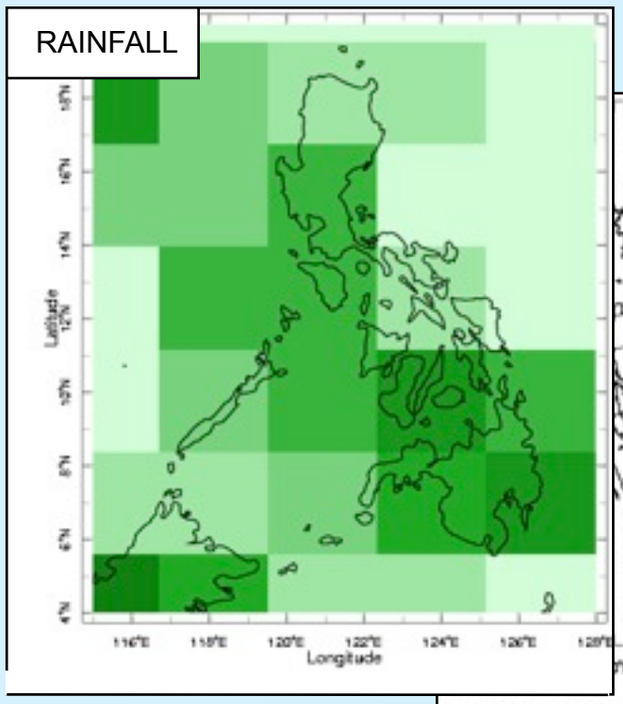


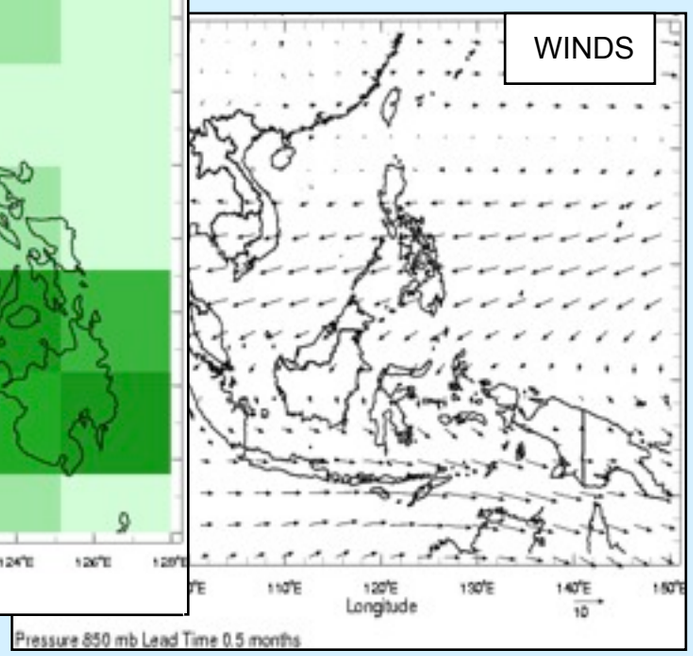
Sea Surface Temperatures



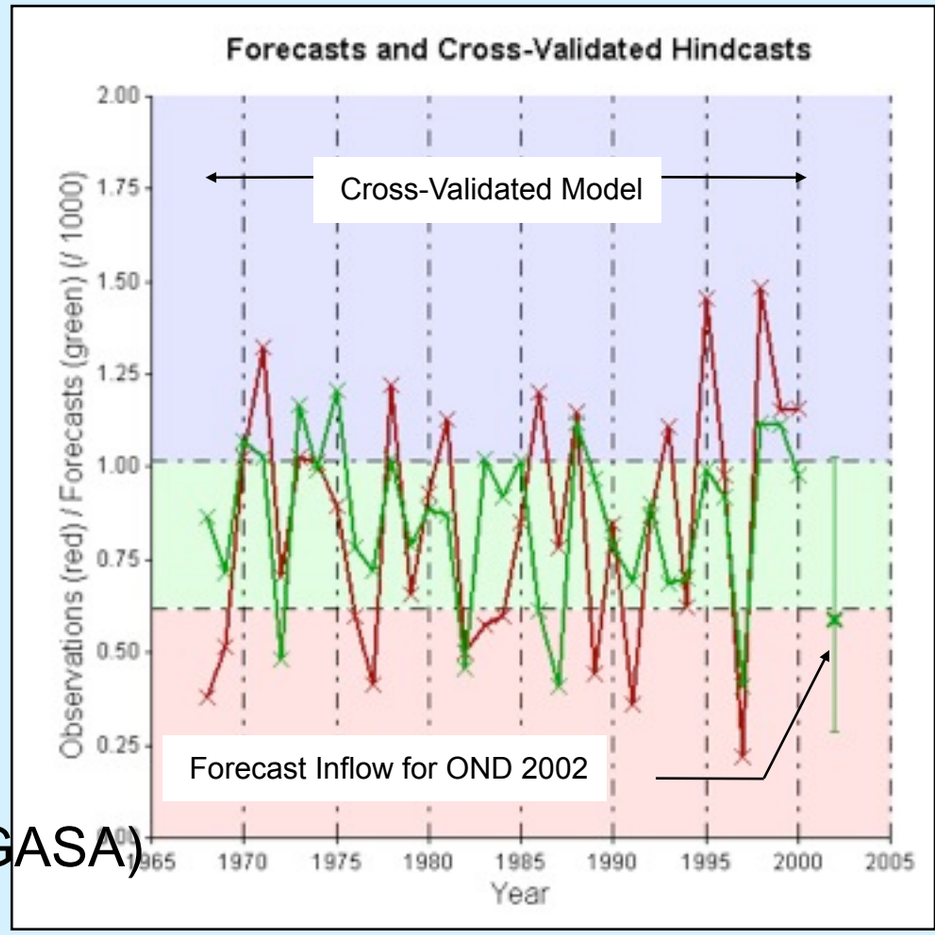
Historical Angat Inflow Observations

Global Climate Model





Statistical Model



B. Lyon (IRI)
A. Lucero (PAGASA)

Integration of Climate Forecasts into Reservoir Management Tool

File Edit View Insert Format Tools Data Window Help

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FORECAST

Inflow Forecast (3 Month)

Home

Seasonal inflow forecast

Climatology for OND

Mean 3 Month Sum = 844 MCM
Std Dev = 319 MCM

5% Exceedance = 320 MCM

Step 2(a). Set Forecast

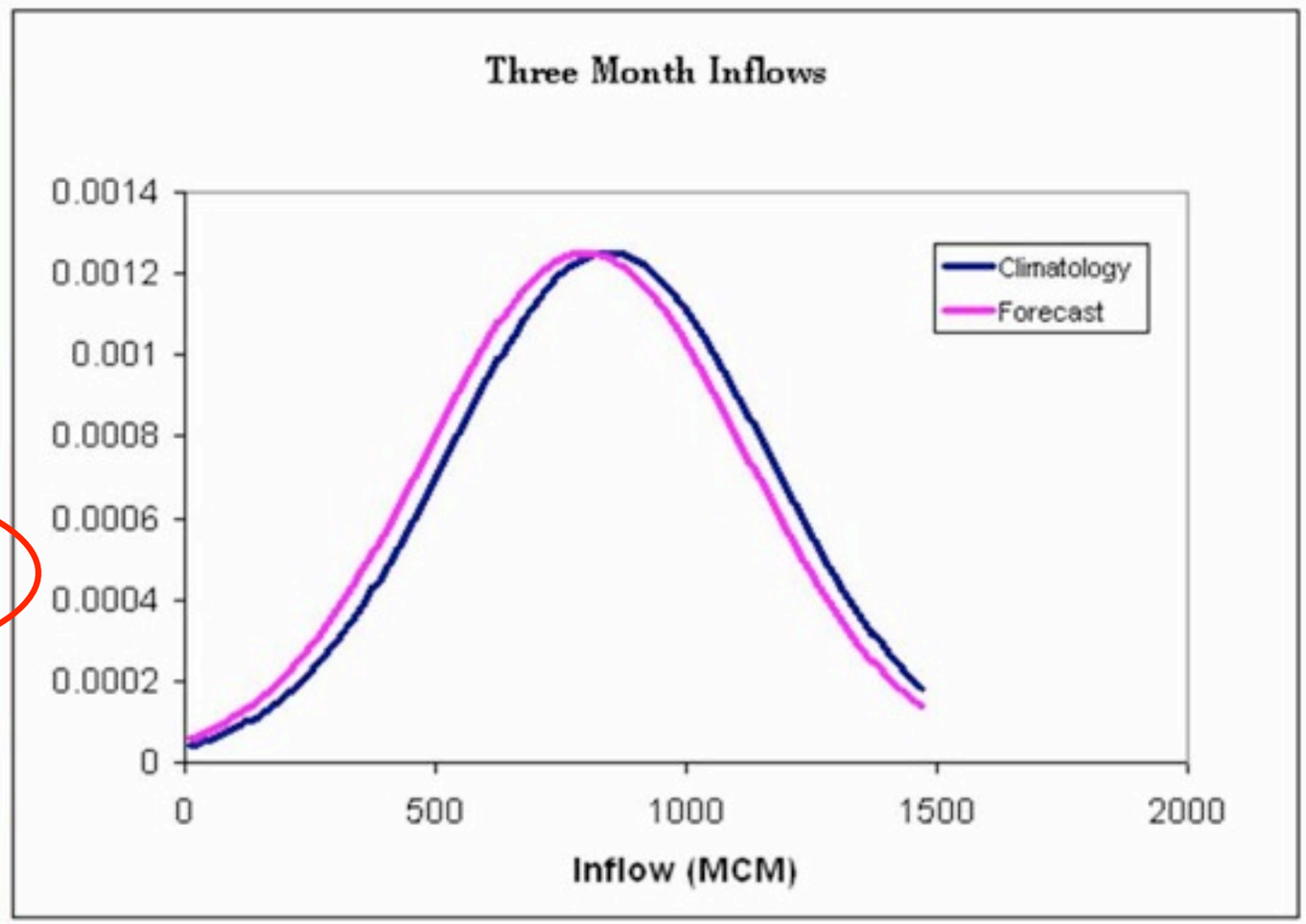
Forecast for OND

3 Month Sum = 800 MCM
Std Dev = 319 MCM

5% Exceedance = 276 MCM

Step 3. Scenario Analysis

Analysis



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Tool: shows probability associated with particular allocations and forecasts

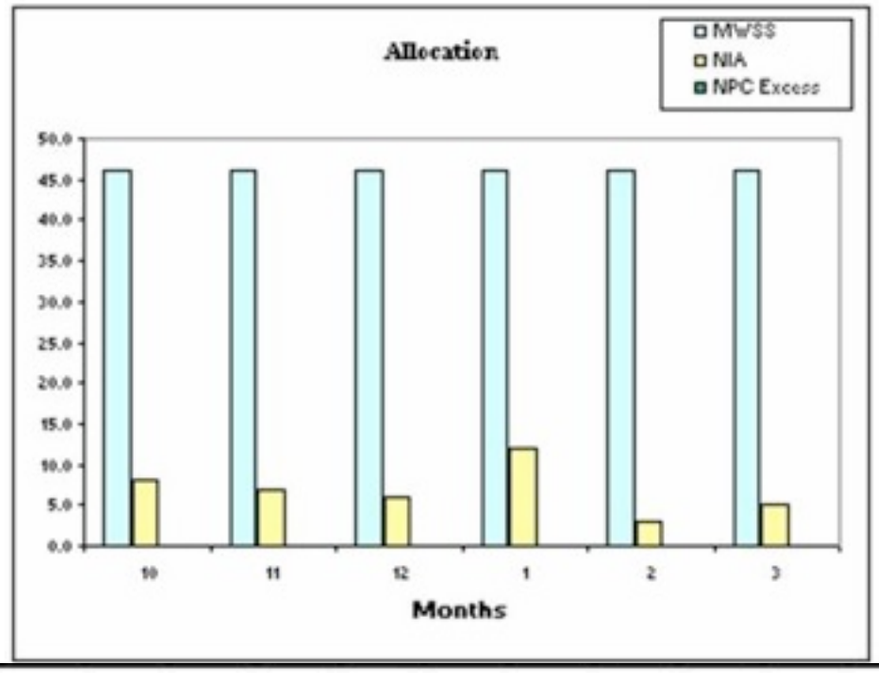
STEP 3(d)

Forecast

Probabilistic

Deterministic Scenario

80 % of Mean



STEP 3(e)

Reliability

Based on whether above

Lower Rule Curve

190.4

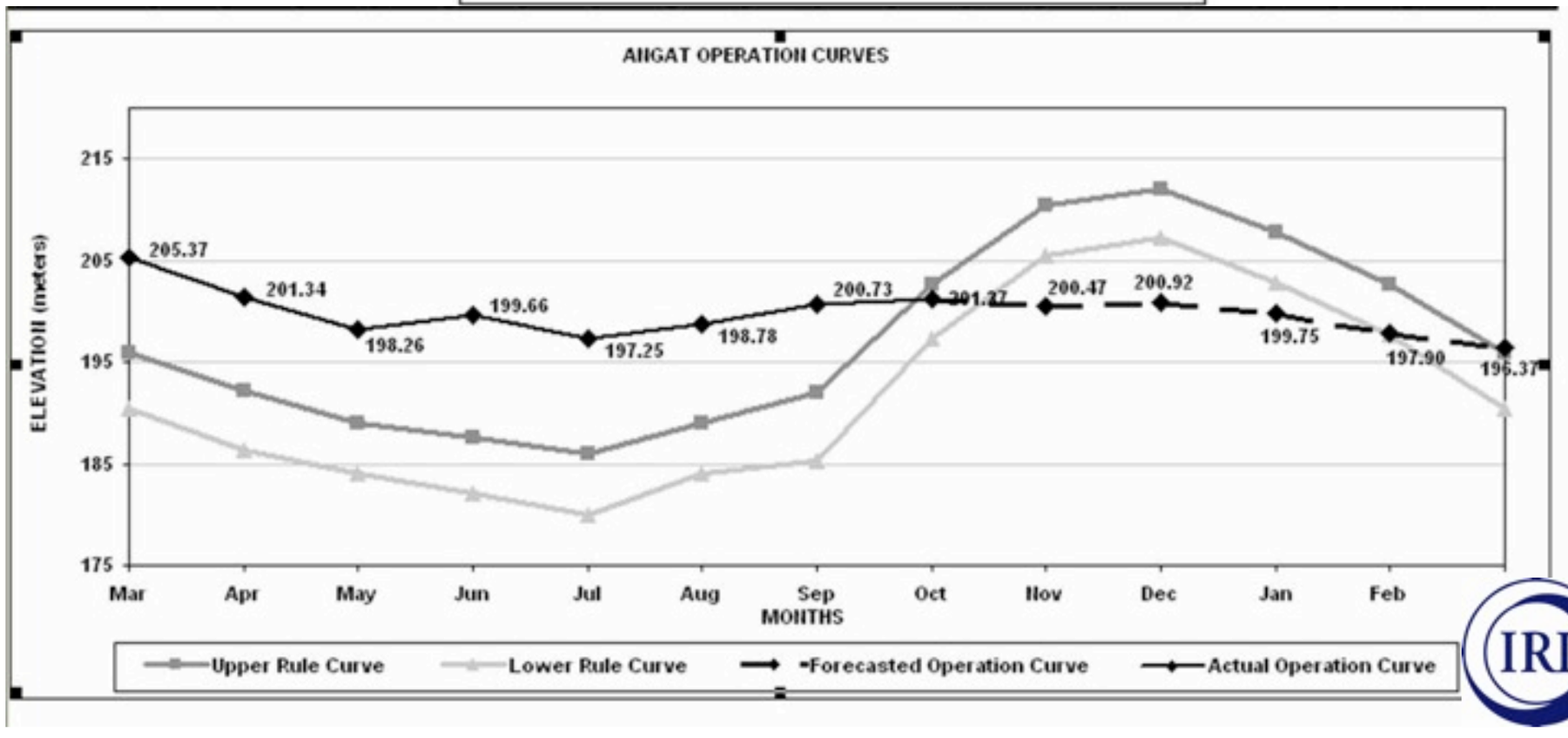
at the end of

Mar

97%

Probability of Failure

3%



Early Warning, Early Action

Red Cross/Red Crescent Climate Centre and IRI, Columbia University

RED CROSS/RED CRESCENT CLIMATE CENTRE

International Federation of Red Cross and Red Crescent Societies

The Netherlands Red Cross

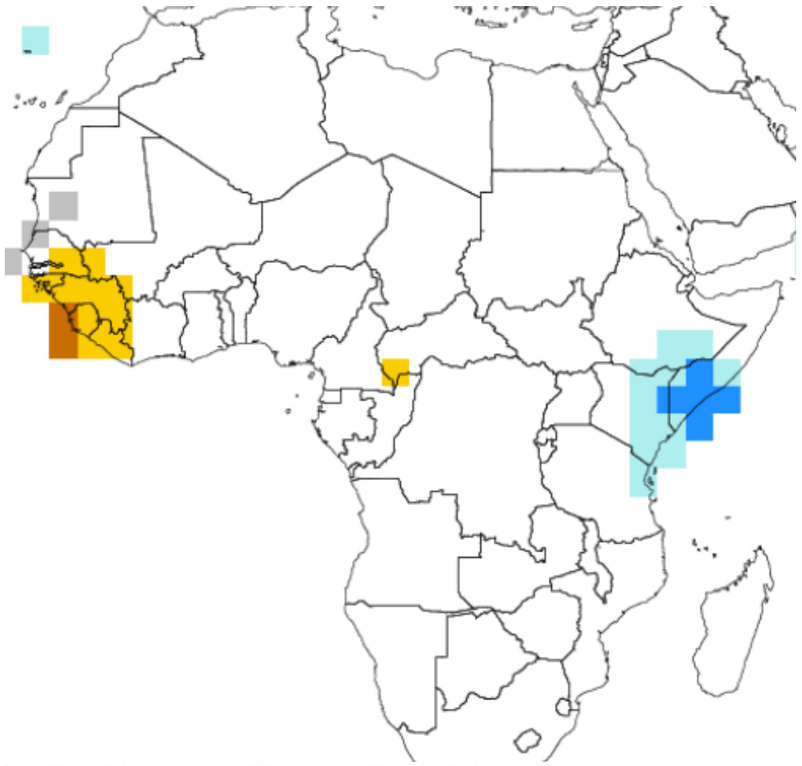
IRI's next forecast:
20 September 2012
http://iri.columbia.edu/ifrc/forecast/3munusualprecip

Africa Regional Forecast: Total Rain and Snow for September-November 2012

Produced by the Red Cross/Red Crescent Climate Centre and the International Research Institute for Climate and Society

Forecast Update: We are now in a very weak El Niño, and this will likely affect rainfall patterns in some areas. Further information will appear in the next few months; continue monitoring seasonal forecasts for the latest information.

IRI Global Forecast Map: Colours on this map indicate *areas where we have increased confidence that the next three months will be unusually wet or dry*. The darker the colour, the more confident we are.



Forecast for Sep-Nov 2012, Forecast Issued Aug 2012

Areas of Concern

We have moderately increased confidence that parts of **Guinea-Bissau, Guinea, Sierra Leone,** and **Liberia** will be unusually dry this September-November.

There is moderately increased confidence that parts of **southern Somalia** will be unusually wet this September- November.

What can I do?

To anticipate impacts, monitor local rainfall forecasts to see when and where rainfall events might occur. Some regional resources include: Seasonal forecasts. For the Sahel, see: ACMAD.

If below-normal rainfall does occur, the following sectoral impacts are possible:

- Increased forest fires
- Food security: change in planting/harvesting times, crop drying/storage
- Poor water quality

If above-normal rainfall does occur, the following sectoral impacts are possible:

- Increased chances of flooding
- Health: enhanced transmission rates of infectious diseases

Are we confident that this season will be unusually wet?

Wet: **Highly increased** confidence (55% chance or greater)	Wet: **Moderately increased** confidence (45-50% chance)	Wet: **Slightly increased** confidence (35-40% chance)	No increase or decrease in confidence (30-35% chance)

Are we confident that this season will be unusually dry?

Dry: **Slightly increased** confidence (35-40% chance)	Dry: **Moderately increased** confidence (45-50% chance)	Dry: **Highly increased** confidence (55% chance or greater)

For more information to help interpret the forecast, see accompanying document called: 'Important Forecast Guidance and Resources'.
If you have any questions, please e-mail the IFRC Helpdesk at IRI: ifrc@iri.columbia.edu.

IRI-IFRC Partnership Products: Climate Briefings

- Seasonal forecast and ENSO updates
- Global and regional
- Disseminated monthly to approx. 100 IFRC disaster managers
- Highlights areas of concern and recommended actions

Archive of climate briefings available here: http://www.climatecentre.org

International Federation of Red Cross and Red Crescent Societies

IRI

Data Library

maproom

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Forecasts

Forecasts

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IFRC Forecast Map Tool

Map Selection

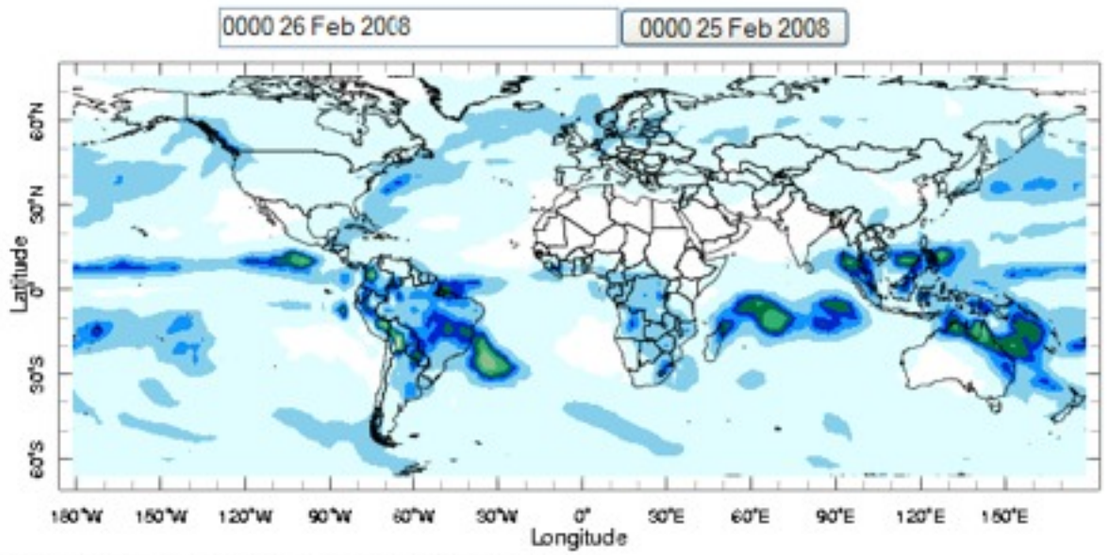
- Six-Day Total Forecast Precipitation (ESRL)
- Six-Day Total Forecast Precipitation Anomaly (ESRL)
- Six-Day Total Forecast Precipitation Percentile (ESRL)
- Six-Day Total Forecast Precipitation as Percent of Mean Monthly Total (ESRL)
- Seasonal Precipitation Forecast (IRI)
- PiC: Same Tendency in Seasonal Forecast and 3-Month Precipitation Observation (IRI)
- PiC: Reversed Tendency Between Seasonal Forecast and 3-Month Precipitation Observation (IRI)
- Monthly Precipitation Climatology (CPC)
- GPWv3 Year 2005 Projected U.N.-Adjusted Population Count (CIESIN/SEDAC)
- Global Distribution of Poverty, Infant Mortality Rate, Year 2000 (CIESIN/SEDAC)

Forecast Start Time:

0000 26 Feb 2008 | 0000 25 Feb 2008

76.25N

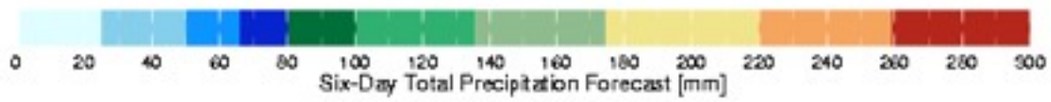
66.25S



Forecast for 26 Feb 2008 - 2 Mar 2008 Issued 0000 26 Feb 2008

178.75E

178.75E



Single-Day (24-Hour) Total Precipitation Forecast Maps					
Day 1 Precipitation Forecast Maps	Day 2 Precipitation Forecast Maps	Day 3 Precipitation Forecast Maps	Day 4 Precipitation Forecast Maps	Day 5 Precipitation Forecast Maps	Day 6 Precipitation Forecast Maps

Different actions are appropriate at different timescales:

Flash flood	Example of early warning	Example of early action
Years	Increasing risk of extreme rainfall events due to climate change Deforestation on hillsides increasing risk of flash floods Increasing population in slums in areas at high flood risk	Continually update risk maps and identify changing vulnerable groups, community-level activities to reduce risk through concrete actions like reforestation, reinforcement of houses, etc.
Months (seasonal)	Forecast of strongly above-average rainfall for the coming season	Revisit contingency plans, replenish stocks, inform communities about enhanced risk and what to do if the risk materializes, e.g., clear drains
Weeks	High ground saturation leading to high probability of flash floods during next high rainfall event	Alert volunteers and communities, meet with other response agencies to enable better coordination, closely monitor rainfall forecasts
Days	Forecast of heavy rainfall that may result in flash flood	Prepare evacuation, mobilize volunteers, get warnings and instructions out to communities at risk
Hours	Very heavy rainfall almost surely leading to flood	Evacuate

- Other organizations besides met svcs may have networks that connect with specific types of stakeholders
- Potential to be very powerful for fcst dissemination & communication, through tailored web-based maprooms

Summary

- Tailored forecasts
    - eg local rainfall amounts for terciles, flexible quantiles, user-defined predictand variables
- Embedding of forecast information within decision making frameworks