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Ethiopian Institute of Agricultural Research (EIAR)



Importance of Seasonal Climate Prediction for Agricultural Research Planning

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**NASA IDS: Seasonal Prediction of Hydro-Climatic Extremes in the Greater Horn of Africa
The Second Participatory Research Workshop and Project Meeting
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Outline

- Introduction
- Importance of Climate Prediction for Agriculture sector
- Objective
- Features and rain bearing mechanizes during kiremt season
- Data and Methods
- Sample Result and Discussion
- Recommendation



roduction

- In Ethiopia, the demand for agriculture output will grow exponentially over coming decades due to population growth and expanding economies.
- To meet this expanding demand, agriculture must become more adept at anticipating climate changes and variations and finding ways of adapting to these changes.
- It depends on by quality information relating to climate predictions that fulfil needs of decision maker , farmers and agribusinesses
- Climate prediction information has the potential to reduce the impact of adverse weather events.



- Climate prediction is in its infancy. However, the payoff from the research and development of reliable climate prediction information can be substantial for the agricultural industry. This is especially important considering the increased frequency of the extreme weather events that we are experiencing and will experience in coming decades.
- Climate prediction information can be utilized by crop and livestock producers and agribusinesses to adapt to and minimize the impact of changing weather patterns and adverse weather events.



Importance of Weather, Climate Prediction

- **Predictions with longer time scale**, such as long-term forecasting and then seasonal and inter-annual prediction, have important role in increasing benefits,
 - improving crop yield,
 - Improve production input planning (e.g., fertilizers, pesticides, fungicides)
 - reducing risk, reducing losses of extreme climate events,
 - making decisions of agricultural development plan.
- **Short-term and mid-term forecasts** are often directly applied in various management strategies,
 - land preparation
 - Crop & variety selection
 - agricultural operation activities (irrigation, fertilizer, herbicide, insecticide application),
 - processing and transporting of agricultural products, etc.



- Due to the pressure on the agricultural sector to produce food, fuel and fiber for an expanding country economy, methods of improving agricultural productivity must be identified and exploited.
- The situation is worsened by the challenges of climate change which will modify temperature and precipitation patterns and increase the frequency of extreme weather events.
- Research to help predict the timing, location and intensity of these changes and events will provide valuable and actionable information to agricultural decision makers to increase production, reduce risk and mitigate the environmental impacts of these events.

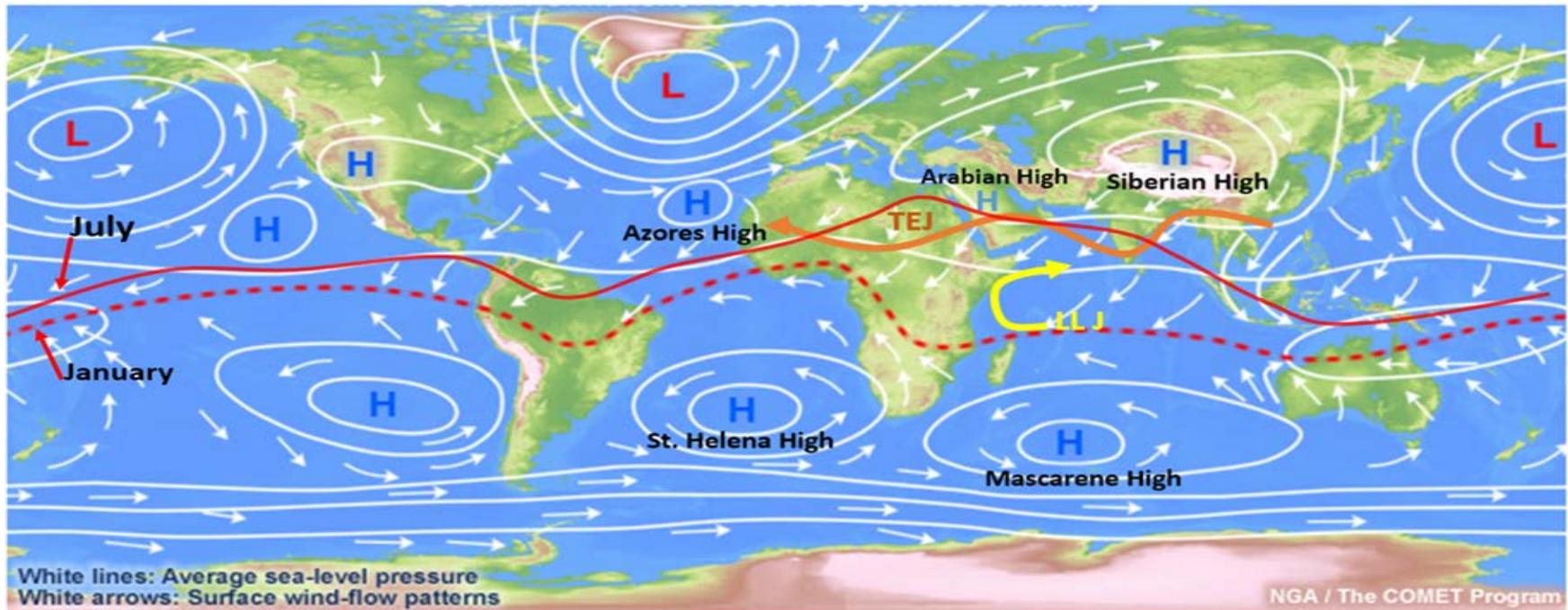
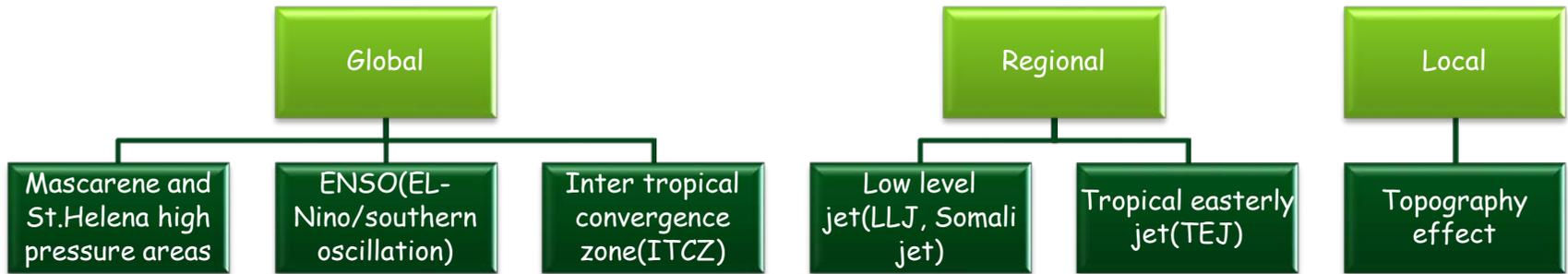


Objective

- To develop high resolution seasonal climate forecast for 2015 kiremt season to the purpose of agricultural research planning.

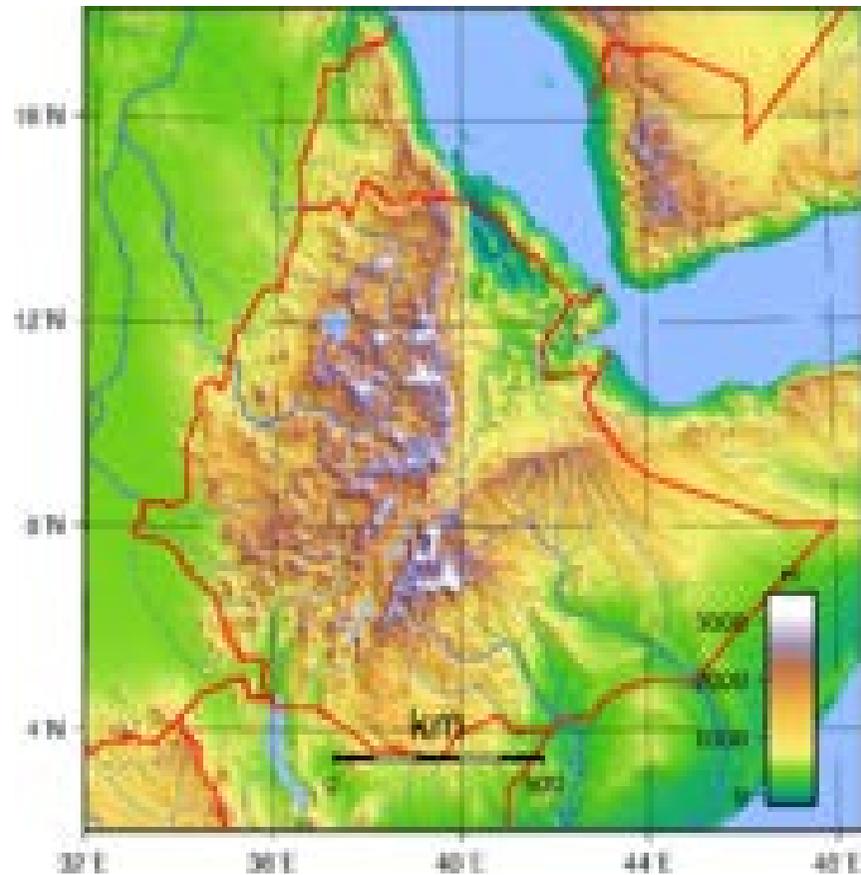
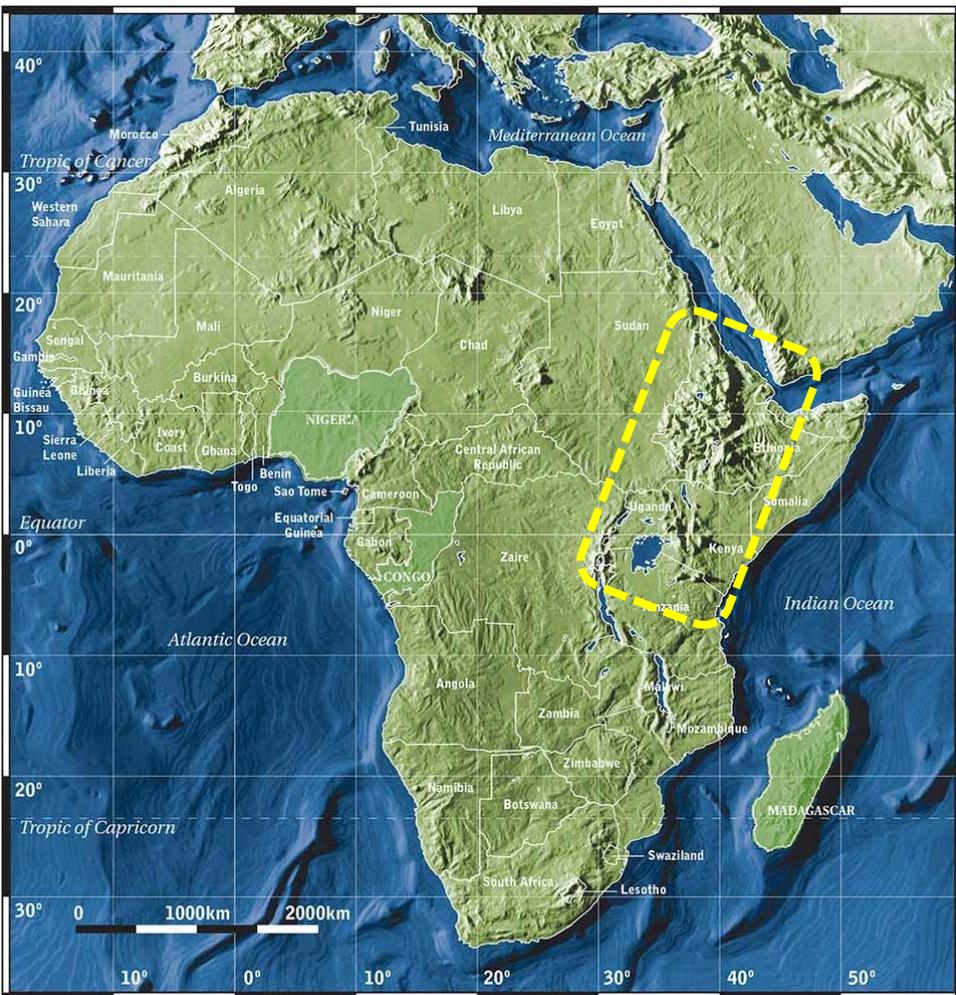


atures and rain bearing mechanizes during Kiremt season





Local Effect





Data and Product Used

Data

- ❖ Historical precipitation station data (EIAR, NMA)
- ❖ Historical temperature station data (EIAR, NMA)
- ❖ NOAA NCDC ERSST global SST anomaly
- ❖ Historical and predicted SST anomaly of Nino 3.4 region
- ❖ African Rainfall Climatology (ARC) data set
- ❖ Gridded rainfall and temperature dataset
- ❖ CPC/IRI ENSO forecast
- ❖ AgMERRA Data



Forecasting techniques,



Teleconnection method



Analogue method



Probabilistic methods



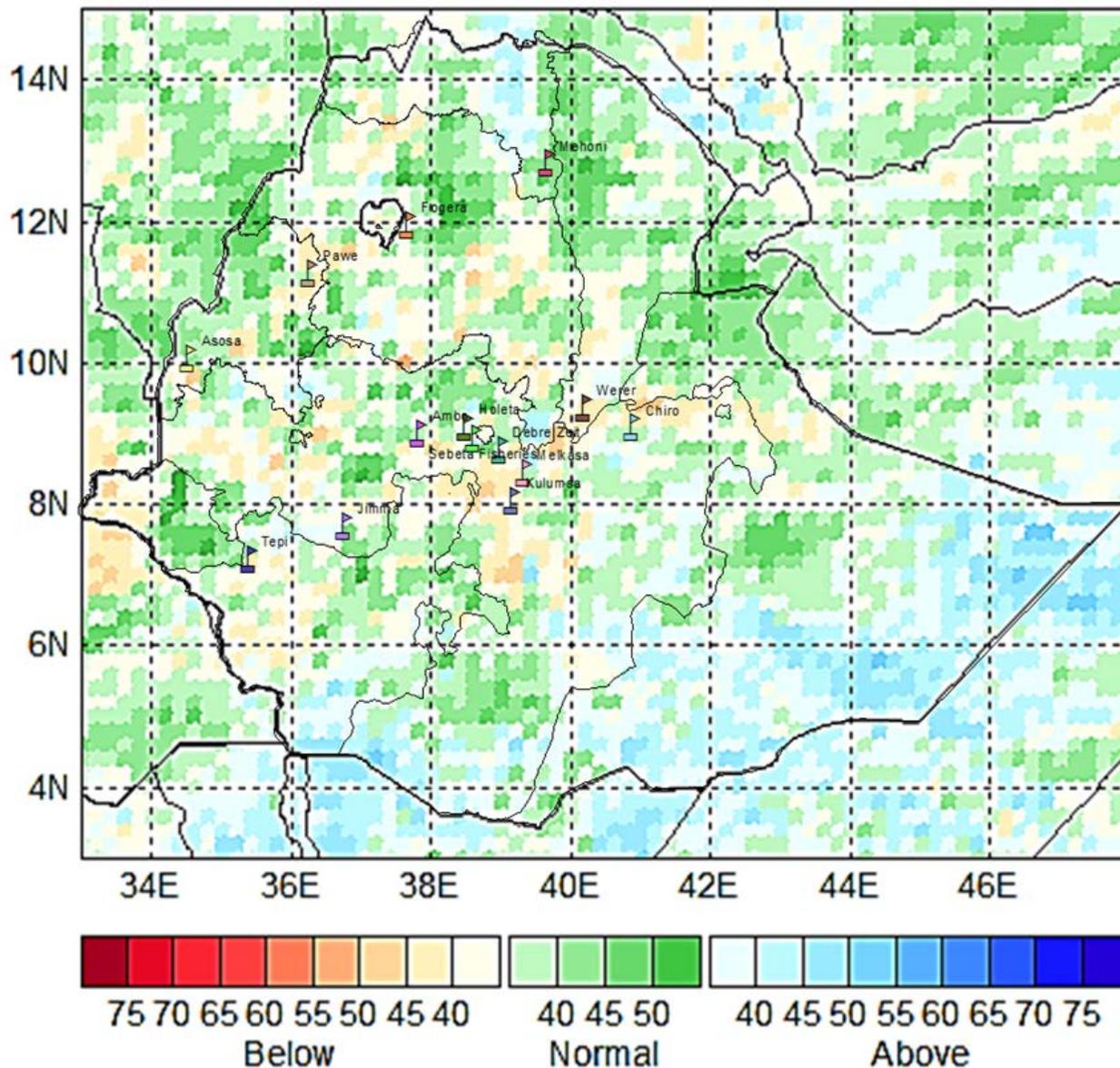
Empirical-Statistical methods



Dynamical Methods /GLOBO/



Stratified Tercile Probability for kiremt 2015



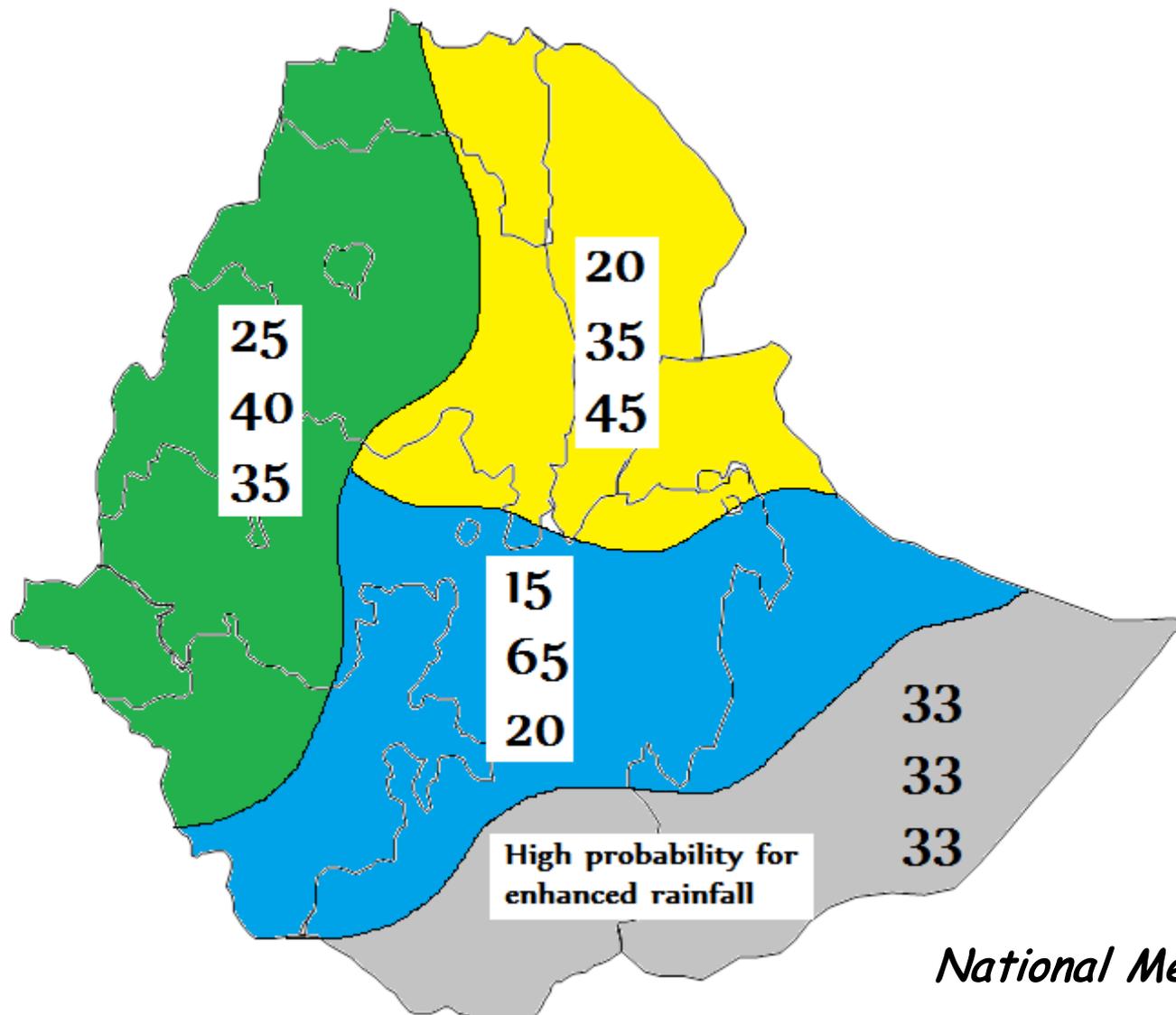
There is a strong tendency for *below normal* rainfall in

- Fogera,
- Pawa,
- Assosa,
- Sebeta,
- Werer,
- Tepi

Agricultural research center.



Decile rainfall probability for Kiremt 2015 season



Legend

Above normal

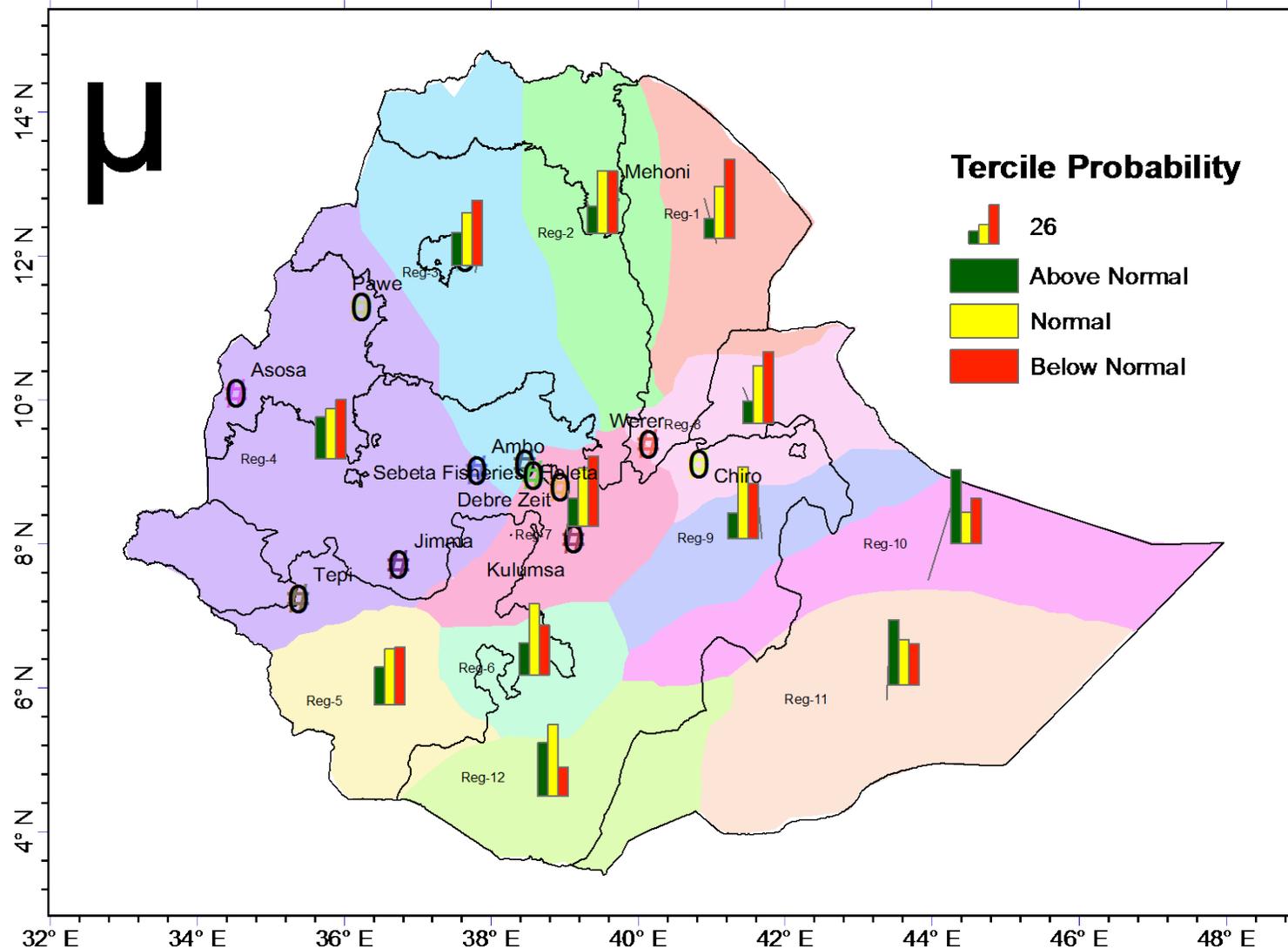
Near normal

Below normal

National Meteorology Agency

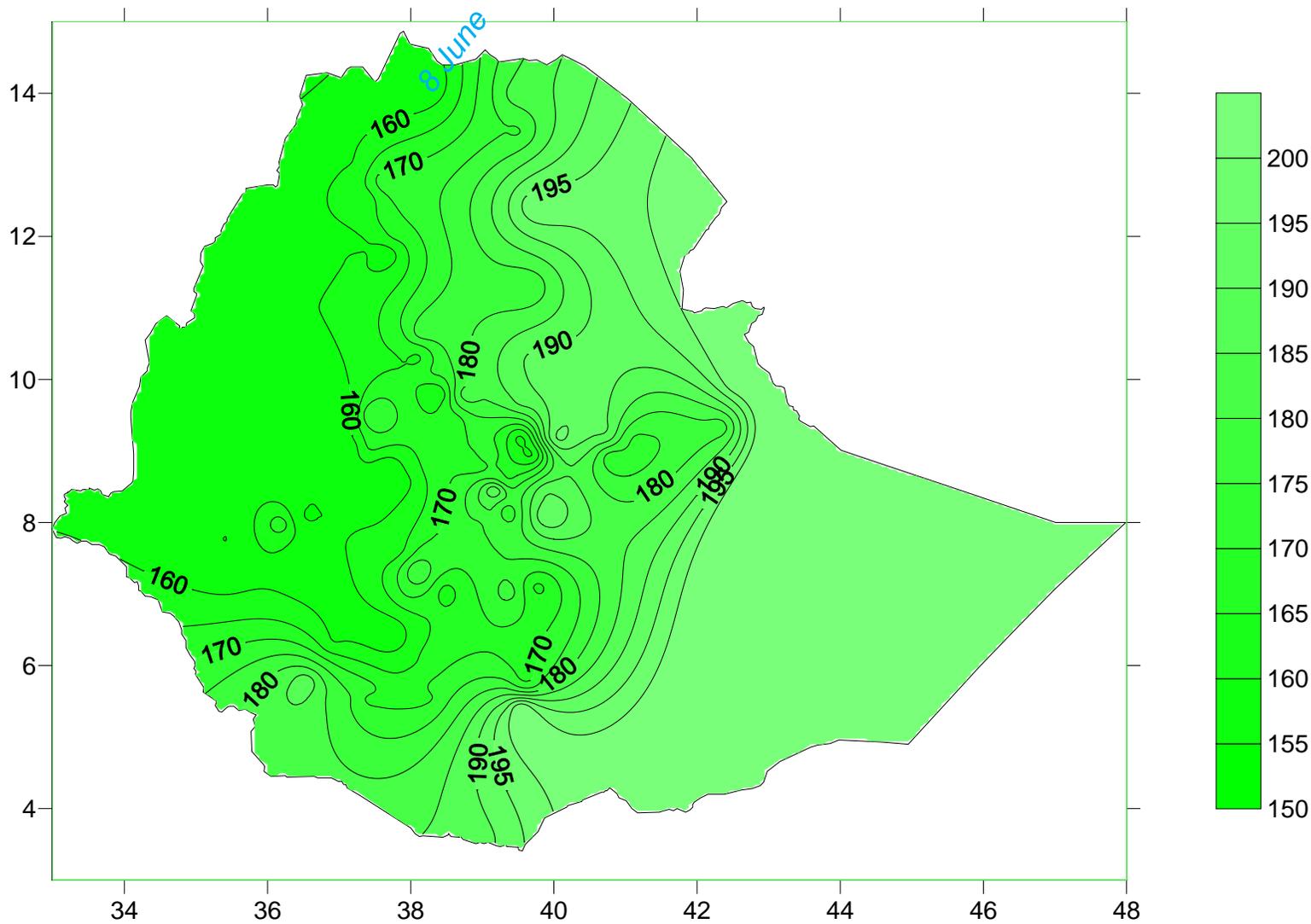


Tercile Probability for Homogenous Rainfall Zone, EIAR



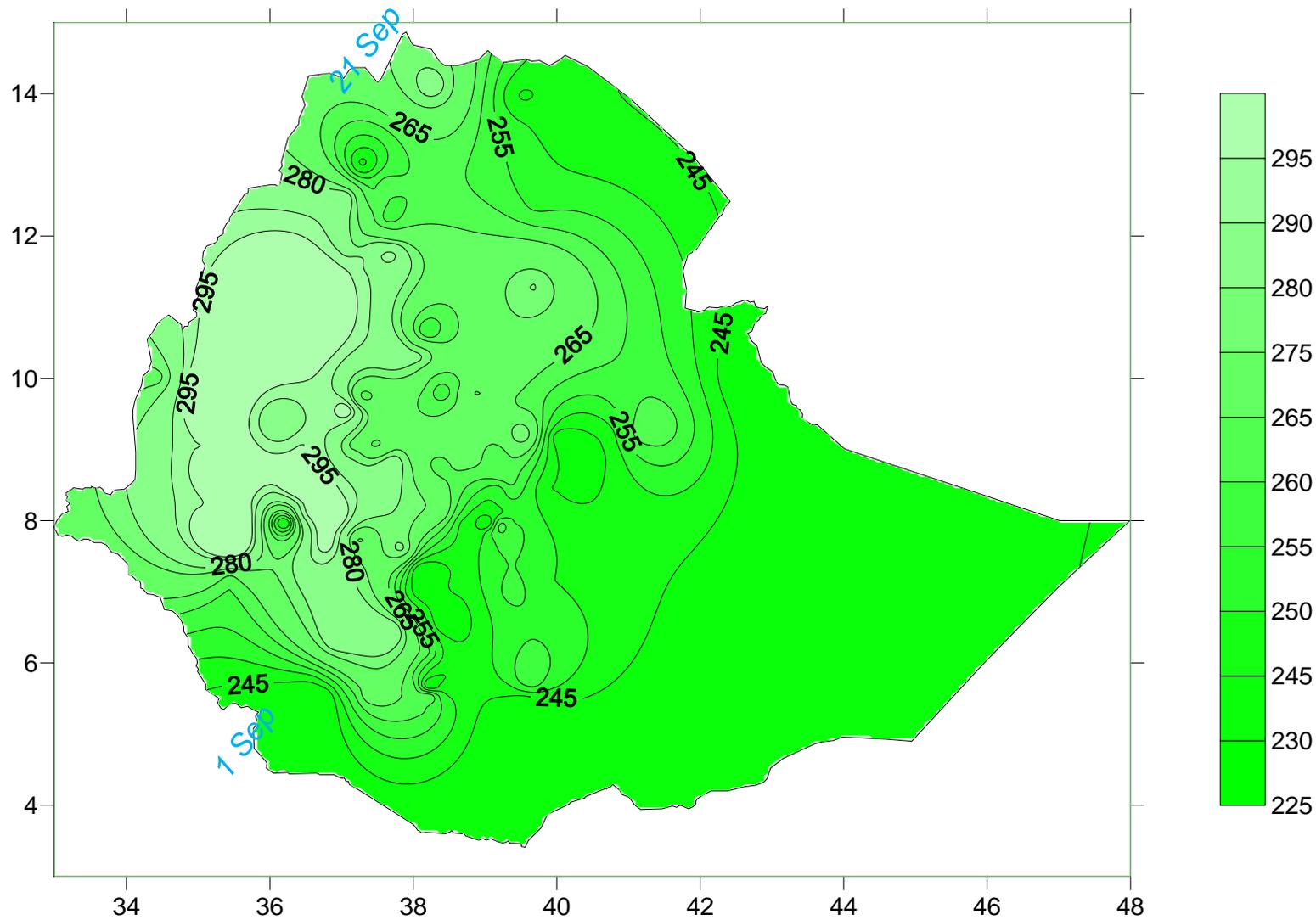


Onset Dates of Kiremt 2015 Rainfall, EIAR





Cessation Dates of Kiremt Rainfall, EIAR





Weather Product

- Kiremt 2015
 - Gridded Monthly and Weekly Forecast
 - Rangeland WRSI
 - Crop WRSI

For more information and update:

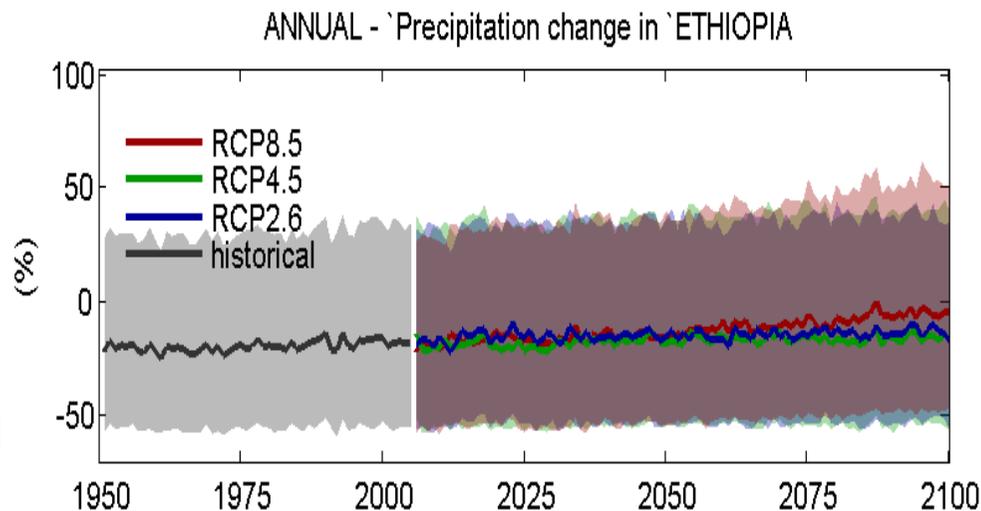
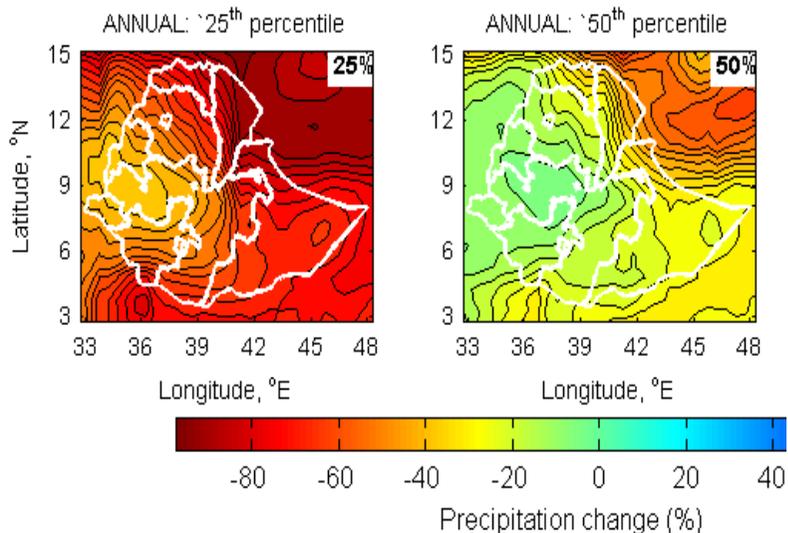
www.eiar.gov.et/AgroWeatherAdvisory/climatefrfst or
www.agrometeear.gov.et/AgroWeatherAdvisory/climatefrfst



AR-CGRD Research Focus Area

- ❖ Undertaking research on Climate Modeling
- ❖ Undertaking research on Climate change impact assessment
- ❖ Undertaking research on Climate change vulnerability assessment and mapping
- ❖ Characterization of Climate induced risks
- ❖ Enhancing the adaptive capacity of rural communities to climate change and variability through enhanced utilization of climate forecasts and agrometeorological advisories
- ❖ Undertaking land suitability mapping for selected crop varieties in Ethiopia.

main research thematic areas can be summarized with the following broad research areas:





Special Thanks

- IAR Top Management
- Melkasa Agricultural Research Center
- Debreziet Agricultural Research Center
- Dr. Alberto Manzuri (ISAC-CNR, Italy)
- Arbaminch University
- All Data Center Provider, especially AgMIP Climate Team Leader Prof. Alex



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Thank You