NMA ብሔራዊ ሚቲዎሮሎጂ ኤጀንሲ
NATIONAL METEOROLOGY AGENCY

Method and techniques of NMA forecasts

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25 October 2017

Addis Ababa, Ethiopia

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- Introduction
- Temporal forecast classification
- Forecast preparation
- Verification
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Introduction

- In Ethiopia Meteorological observations have started in the nineteenth century, mainly by European missionaries.
- But in 1951, Meteorological services was established as small unit in the then Civil Aviation Department to render aeronautical services.
- As the importance of meteorology was realized by other economic sectors, i.e., non-aviation sectors, other government offices used to provide meteorological information that tended to duplicate meteorological works.

Cont'd

- National Meteorological Agency (NMA) was established by Government Proclamation Number 201/1980, accountable to Water Resource commission (Currently, Ministry of Water, Irrigation and Electricity)
- <u>NMA basic strategic areas</u>

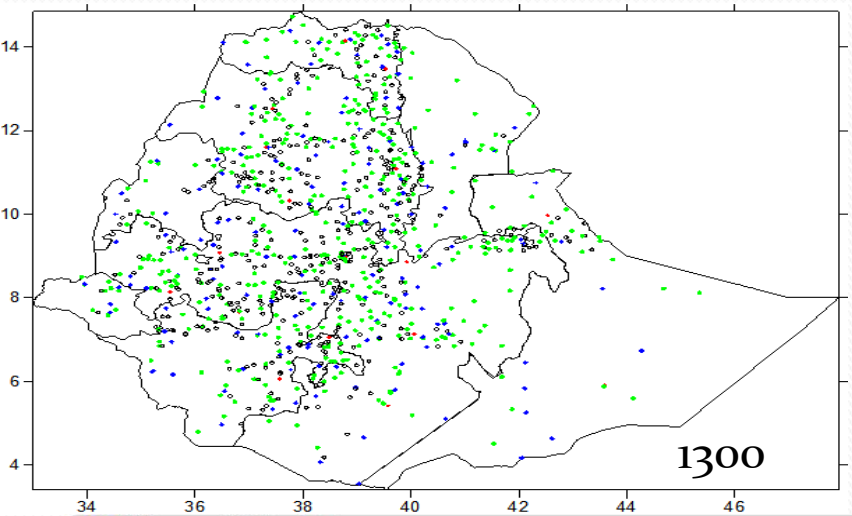
➢ Basic Meteorological Services

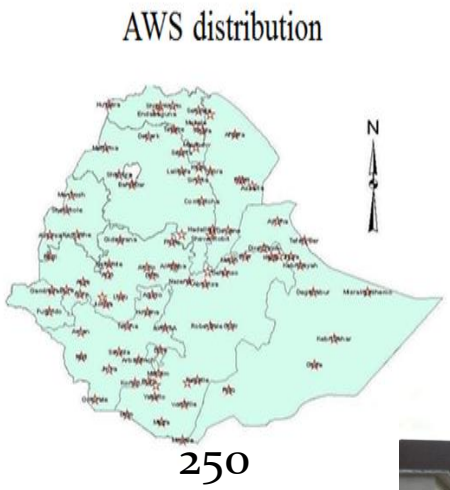
➢ **Reliable weather and Climate Forecast and Early warning**

➢ Meteorological Research and Studies

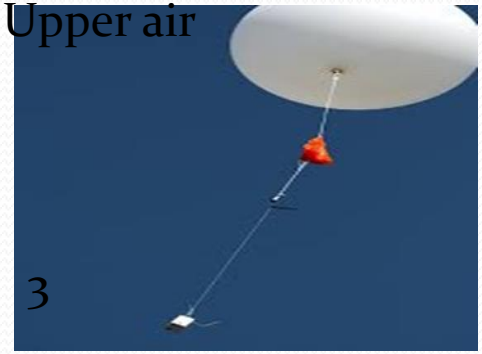
Sources of weather information

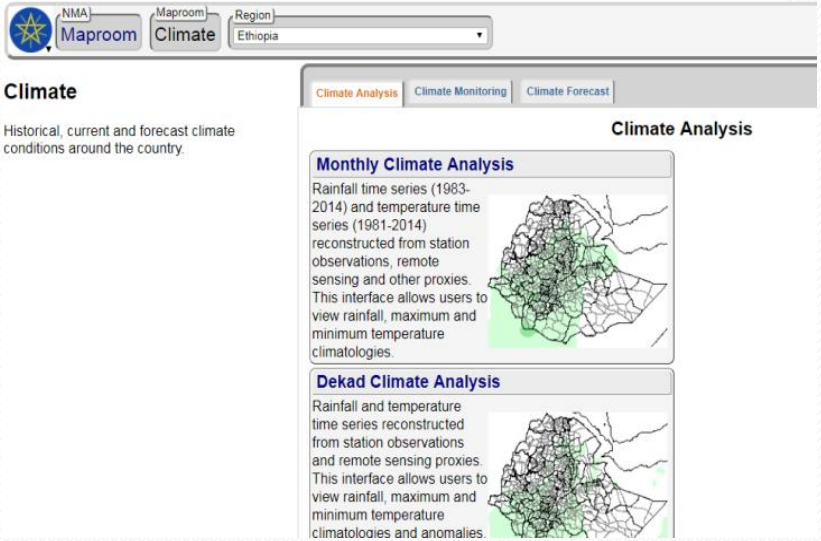
Station distributions





Upper air





Temporal forecast classifications

Now-casting

- A description of current weather parameters and 0 -2 hours description of forecasted weather parameters

Short-range weather forecasting

Beyond 12 hours and up to 72 hours

description of weather parameters

Medium-range weather forecasting

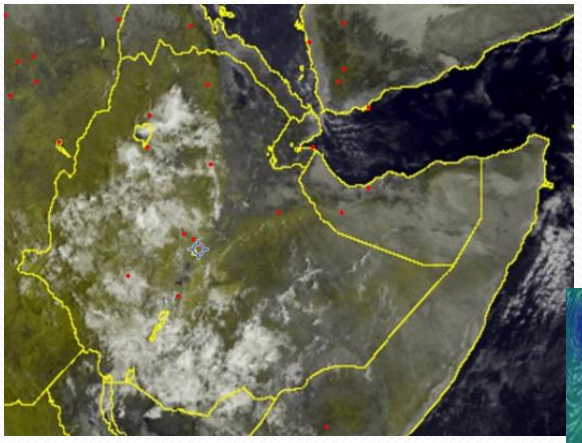
a period of 3 days to 10 days

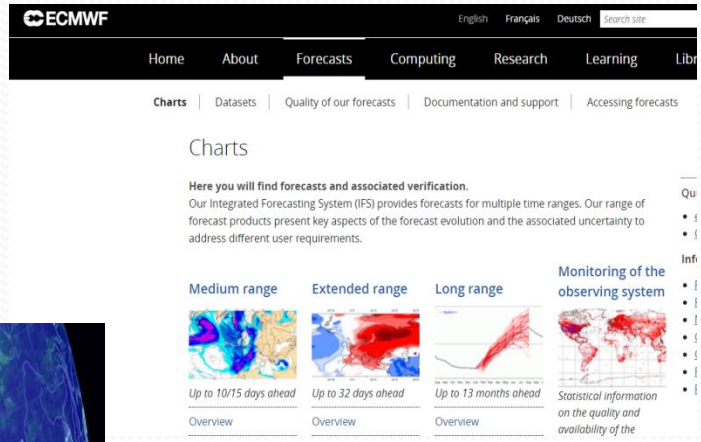
Long-range forecasting

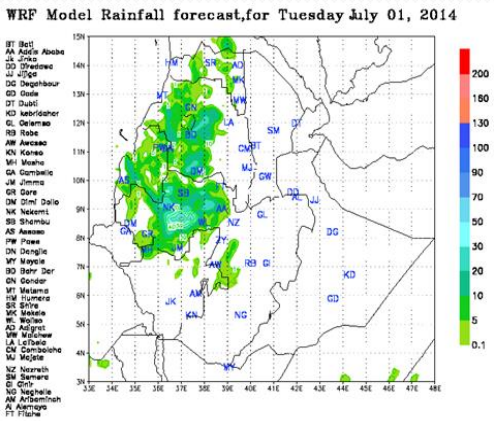
From 30 days up to four months/

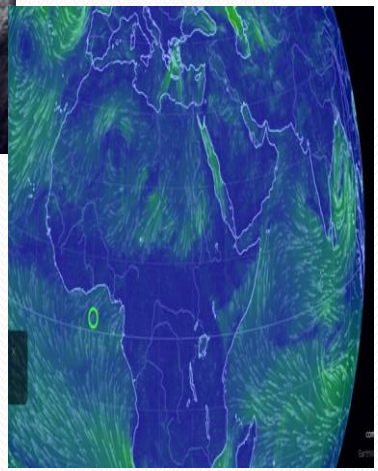
years

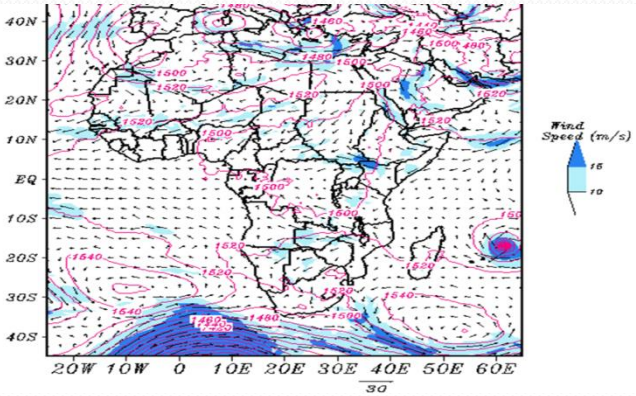
Global weather products











Seasonal forecasts

- In Ethiopia, the seasons are unique and are classified based on annual rainfall patterns.
  - based on the mean annual and mean monthly rainfall distributions, the rainfall regimes are delineated and the types of seasons in Ethiopia are identified as
    - Bega (October-January)
    - Belg (February-May)
    - Kiremt (June-September)

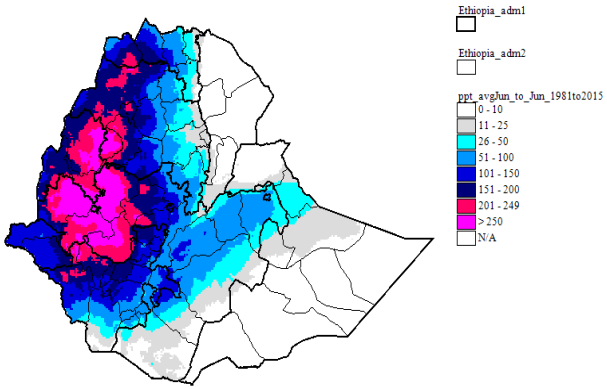
Climate prediction in Ethiopia

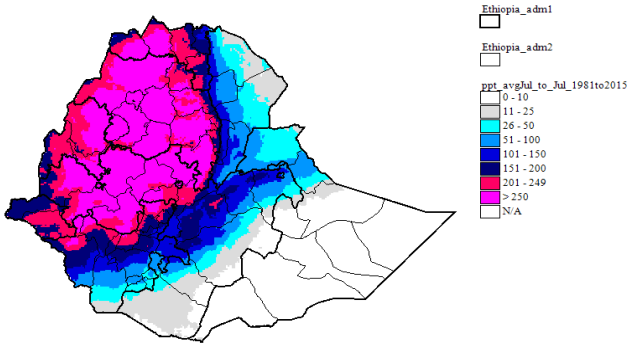
- Seasonal climate prediction began in 1987
- For three seasons, Bega, Belg and Kiremt
- Sources of input parameters
  - from Local, regional and global
- Parameters set for predictions
  - Rainfall- amount, distribution, intensity, onset and cessation, wet and dry spells
  - Temperatures-Extremes

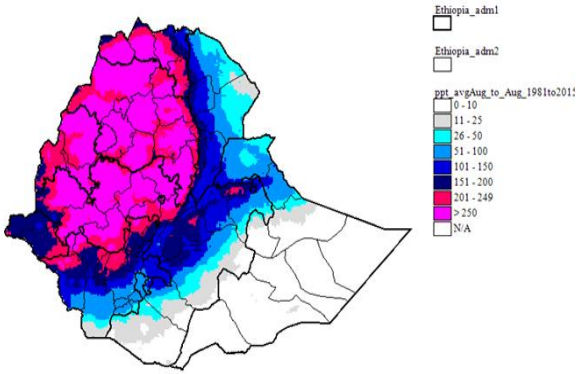
Techniques for seasonal forecast

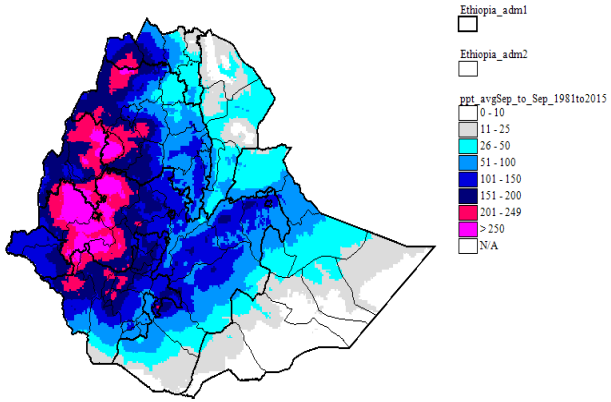
- Station data and climatology for the given season
- Global and regional weather producing systems
- ENSO/IOD phenomena
- Dynamical and statistical model outputs
- Selection of best analogues years

Climatology of the Kiremt rain

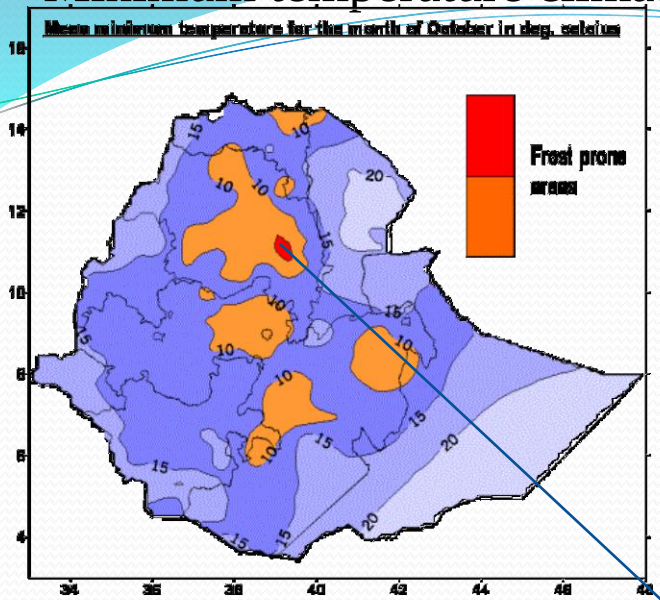


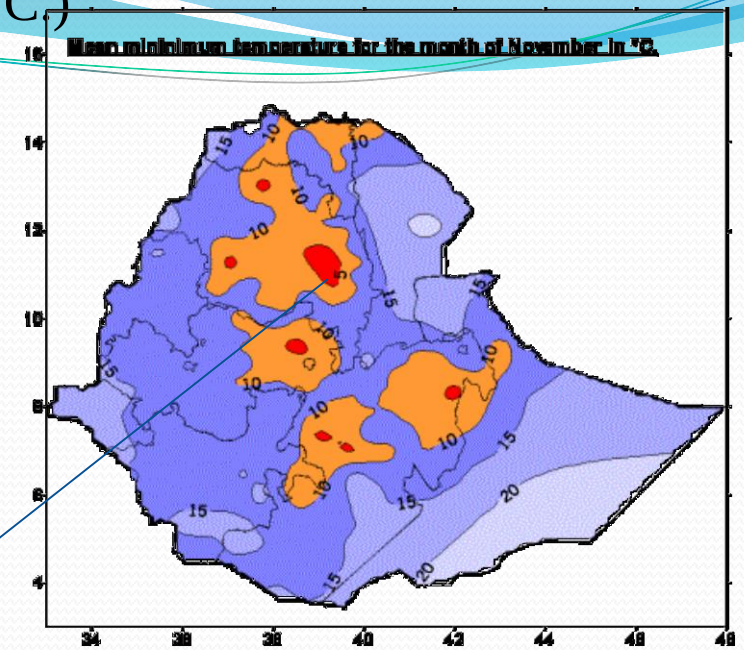




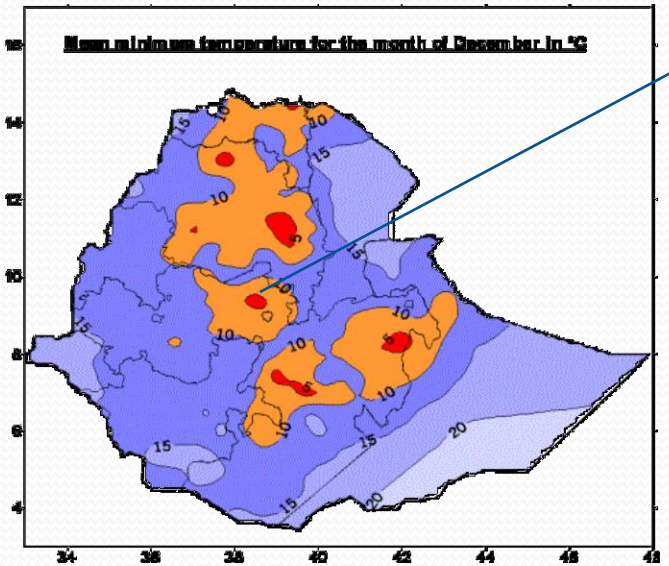


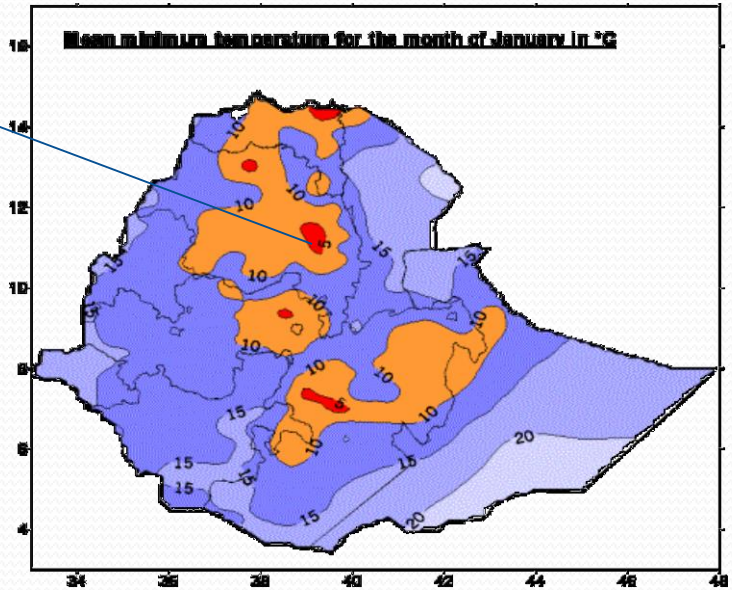
Minimum temperature climatology (in deg. C.)



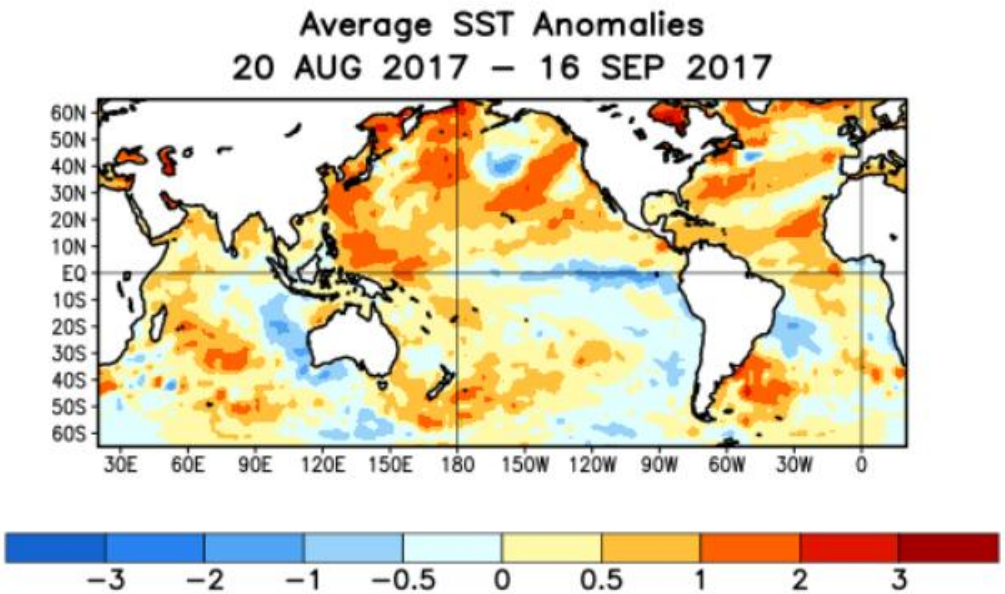


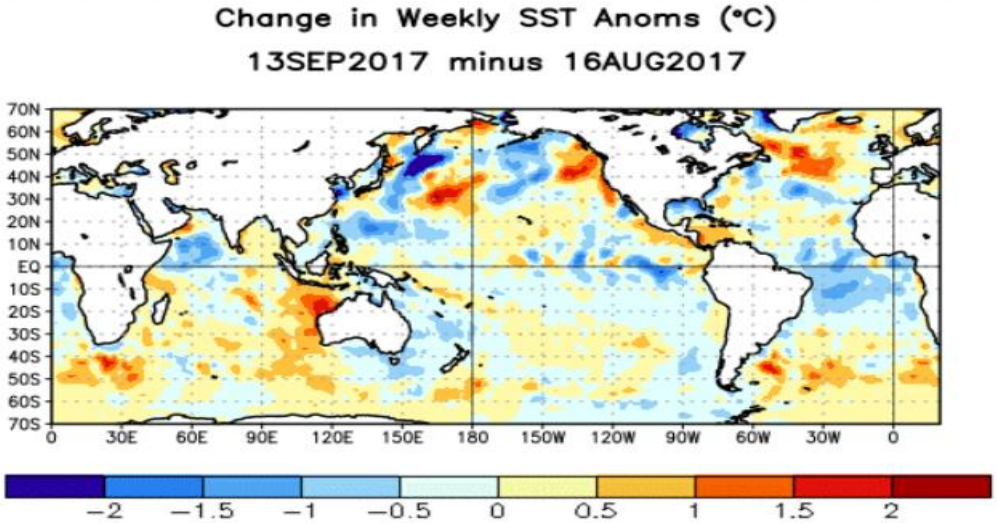
Areas affect by frost

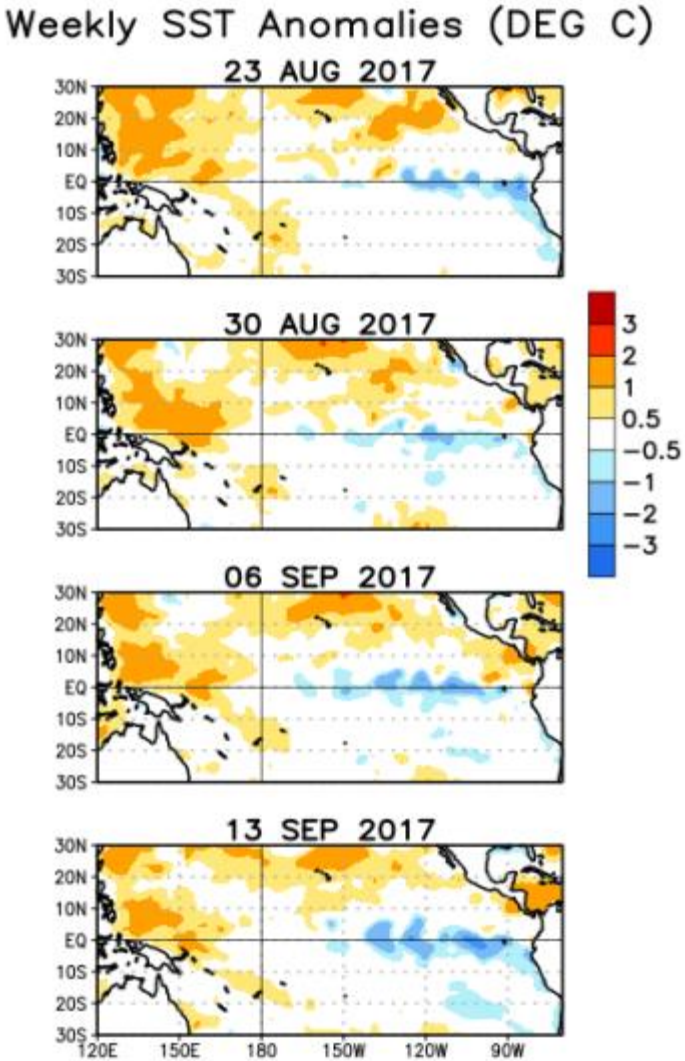




Global Oceanic condition



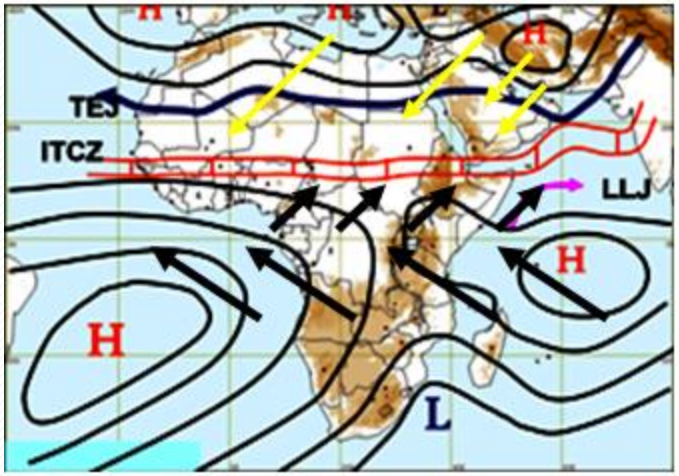




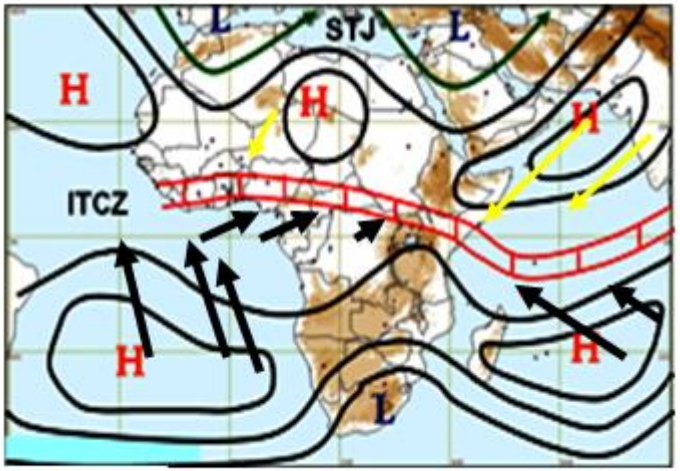
Weather producing systems

- Arabian, Siberian, Saharan, Mascarene, St. Helena and Azores highs
- ITCZ
- LLJ (Somali Jet)
- Cross equatorial flows
- TEJ
- Thermal lows

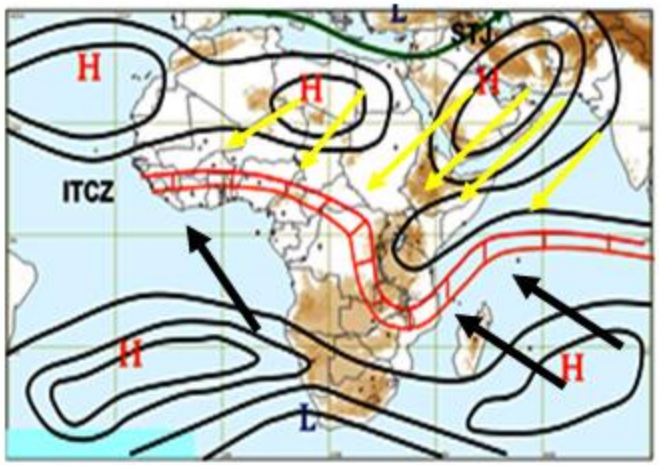
Global climate systems



Kiremt



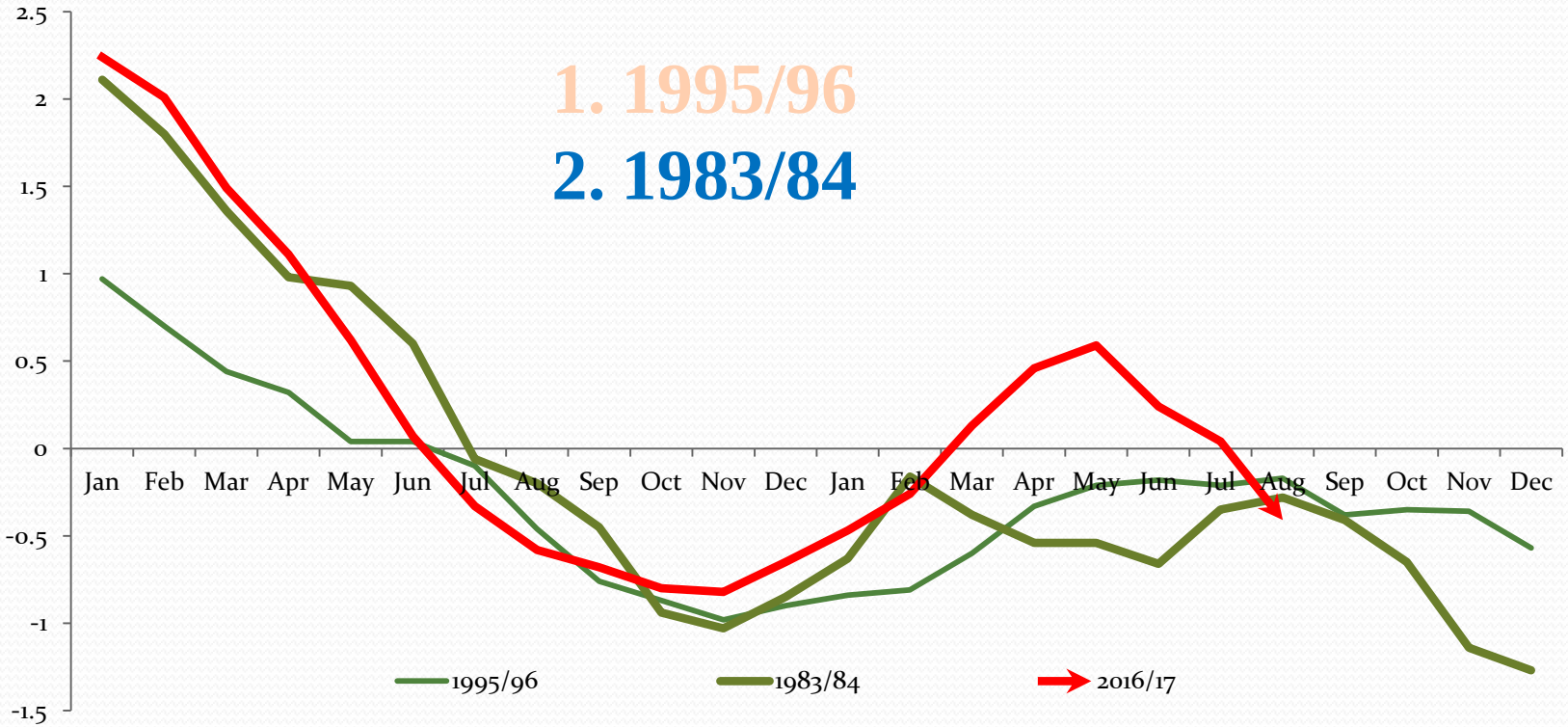
Belg

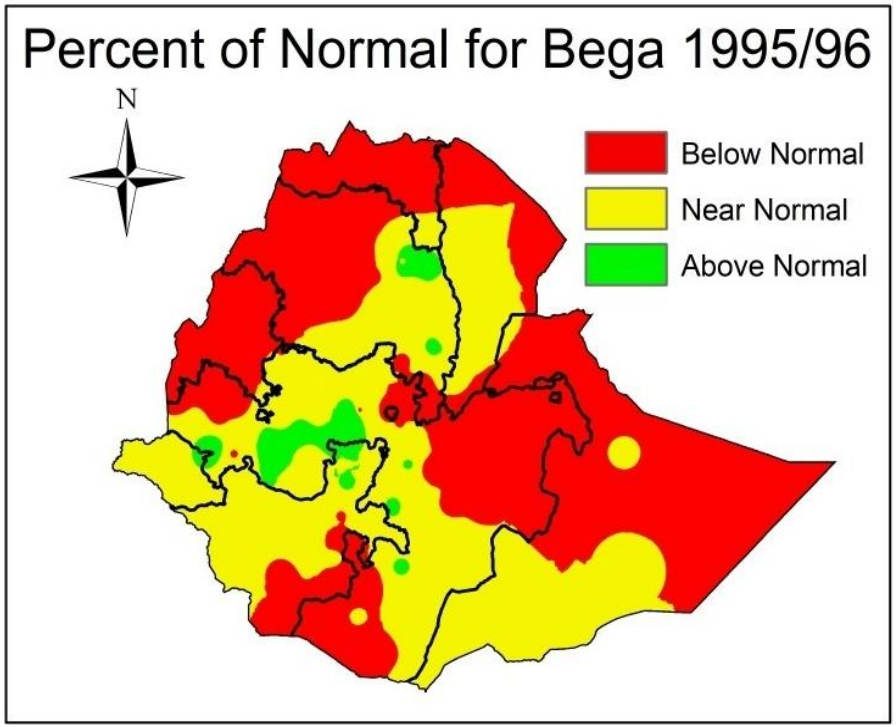


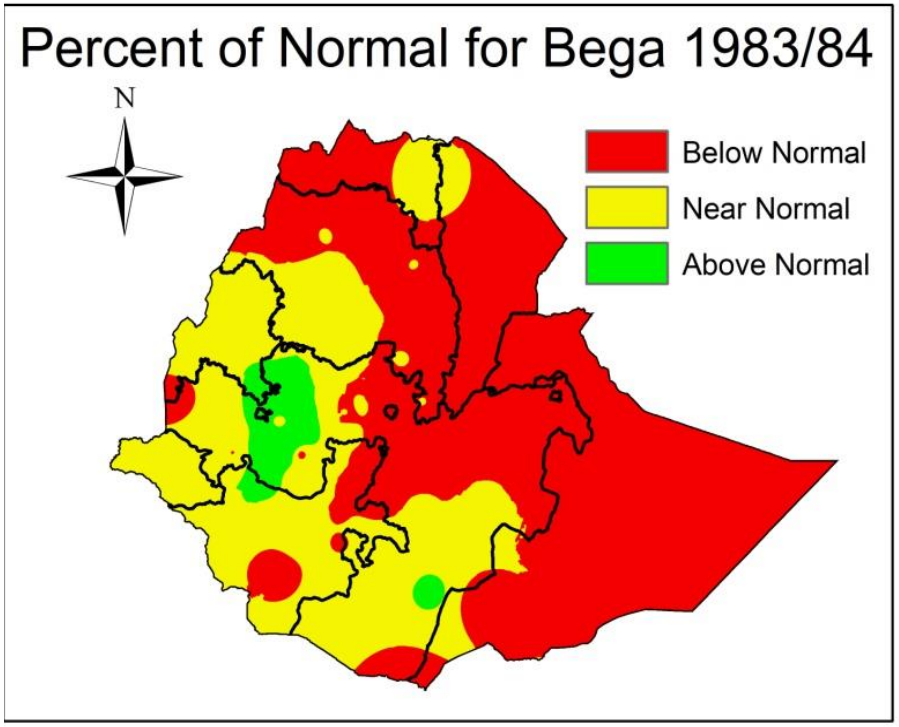
Bega

Analogue selection

Best Two Analogue




Percent of Normal for Bega 1995/96
N
Below Normal
Near Normal
Above Normal

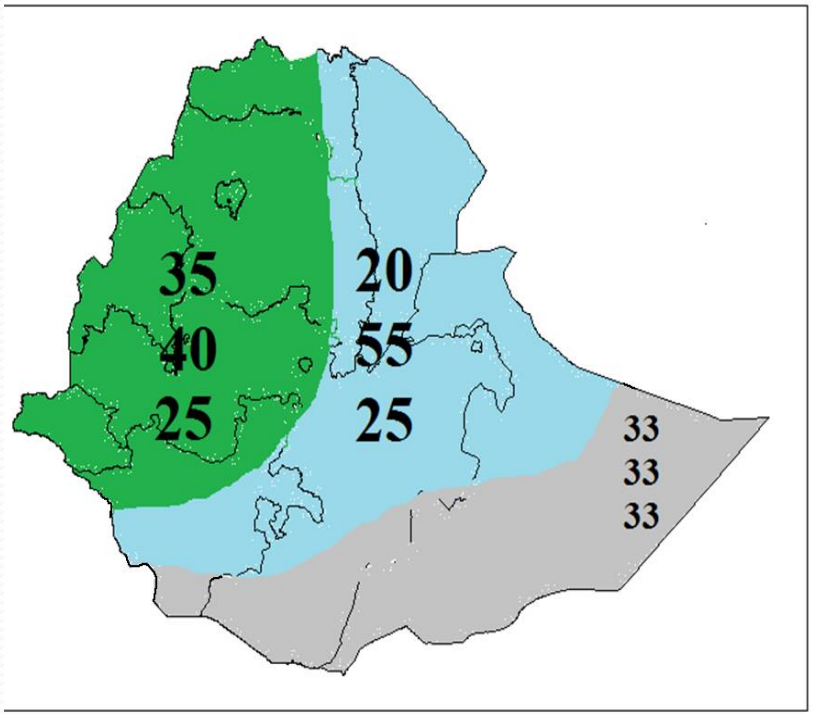

Percent of Normal for Bega 1983/84
N
Below Normal
Near Normal
Above Normal

Inclusive

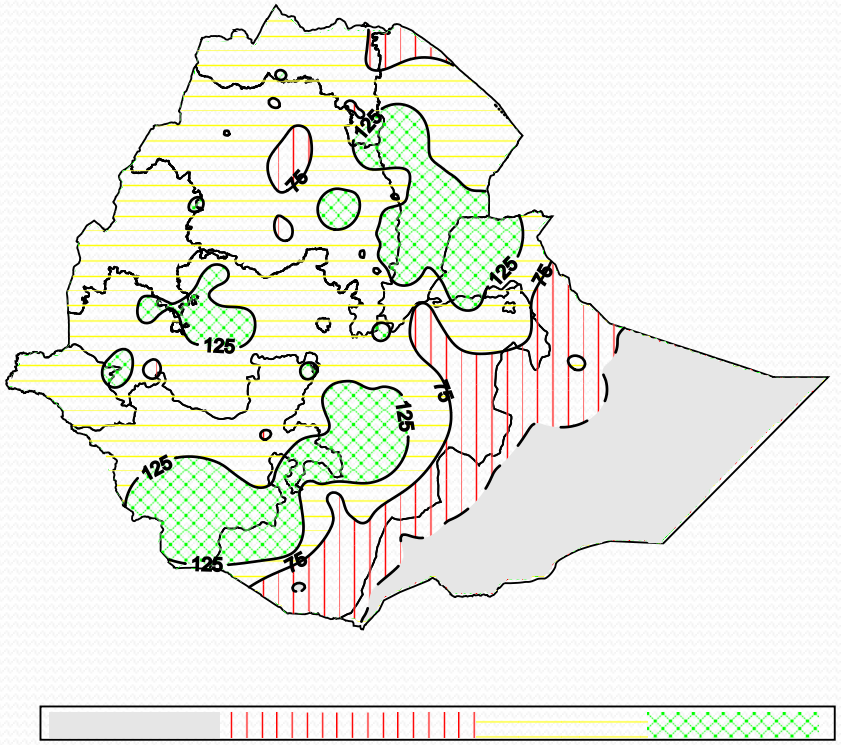
- Global, regional and local pre-seasonal indicators
- Dynamical/statistical predictions
- Analogue years performance
- Different Dynamical and Statistical Simulation

Verification

Tercile rainfall probability for Kiremt 2017 season

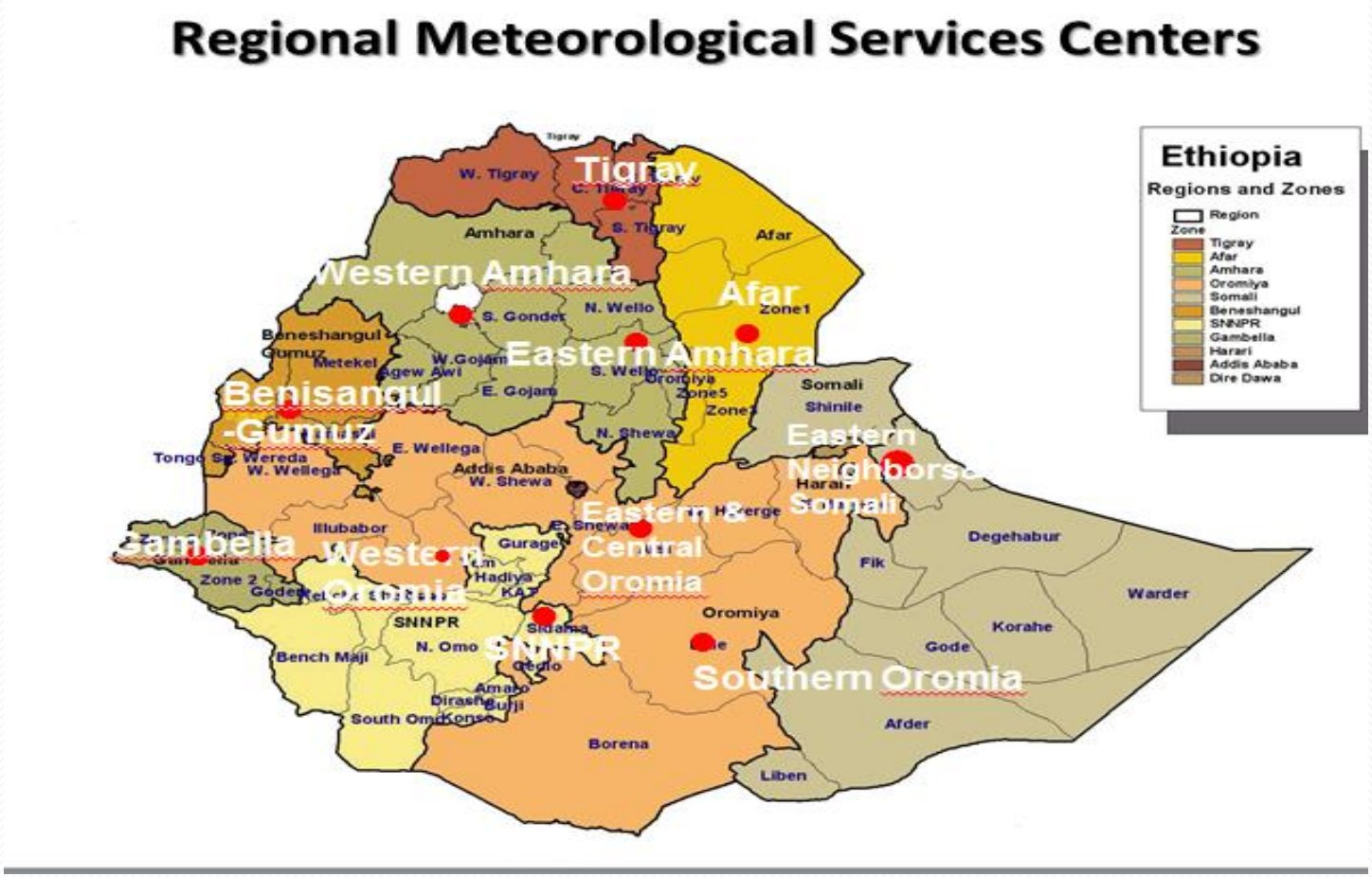


Percent of Normal Rainfall for Kiremt (June1-September 20, 2017)



Climatollogically dry BN N AN

Forecast dissemination techniques



Cont'd

- Government structure
- Television
- Radio
- Workshops and conferences
- E-mail
- Phone
- News paper
- Templates
- Website
- Bulletin (10 daily, monthly, mid-season and seasonal basis)

Cont'd

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Three Day Forecast

As of October 16, 2017

#	City	October 17, 2017 Temperature Min Temp	Max Temp	Weather Condition	October 18, 2017 Temperature Min Temp	Max Temp	Weather Condition	October 19, 2017 Temperature Min Temp	Max Temp	Weather Condition
1	Adama	16	30		15	31		15	31	
2	Addis Ababa	13	24		14	24		12	25	
3	Arba Minch	18	28		19	29		19	29	
4	Asosa	16	25		15	26		15	26	
5	Bahir Dar	16	27		17	28		17	28	
6	Bale Robe	10	22		11	23		11	23	

Stakeholders

- Governmental and non-governmental organizations
- Agricultural
- Water
- Health
- Tourism
- Construction
- Transport
- Universities
- Research institutes

Conclusion

- Modernization of infrastructure (HPC, AWS and human resources)
- More reliable forecast
- Strong relation within national and international institutions
- Increasing of better understanding of weather and climate information in the communities for their activities

Thank you for your attention!!!