Tendências do Clima Global: Mais Quente, Mais Seco, Mais húmido. Algumas tendências do Clima de Angola.

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Team (ISP Tundavala):

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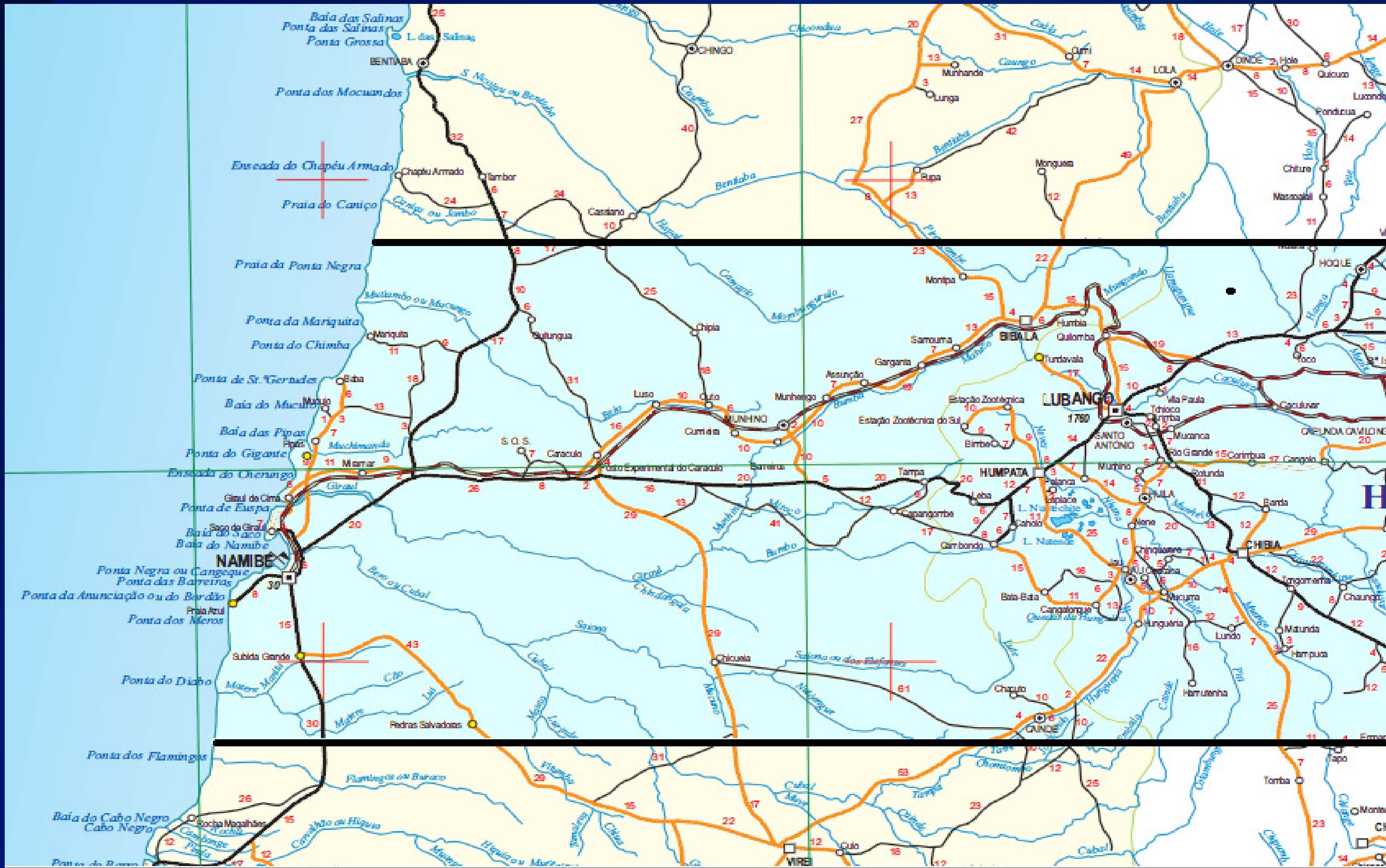
This Task is connected with task 139, also from ISP Tundavala, about measurement of runoff and sediment flow in the river basins of Namibe region

Area of Study



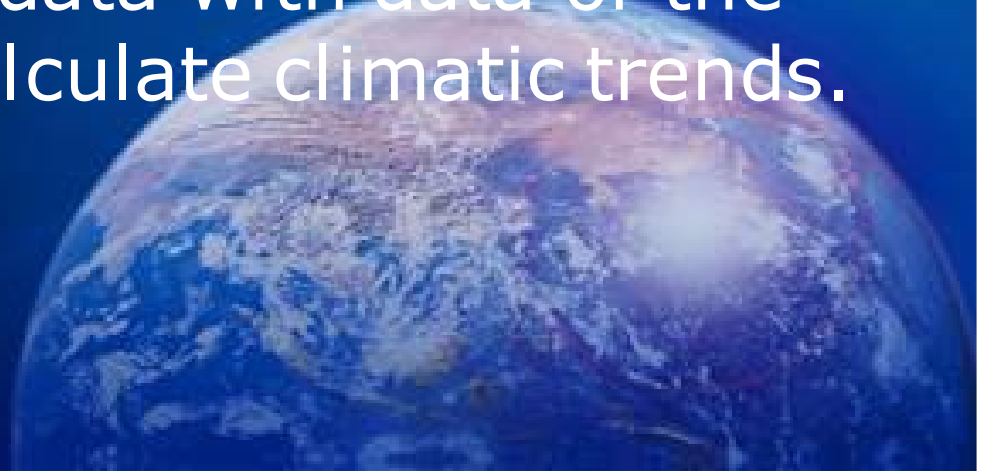
Main Objectives

- To install an accurate and reliable network for studying major climatic parameters Southeast of Angola, namely Huíla and Namibe region
- To study the characteristics of local climate in what directly concerns the general conditions
- To compare nowadays climatic data with older data that is available (1960-1974)
- To study the means to control erosion and reduce flood danger related to task 139.

Event in 2011

Other Objectives

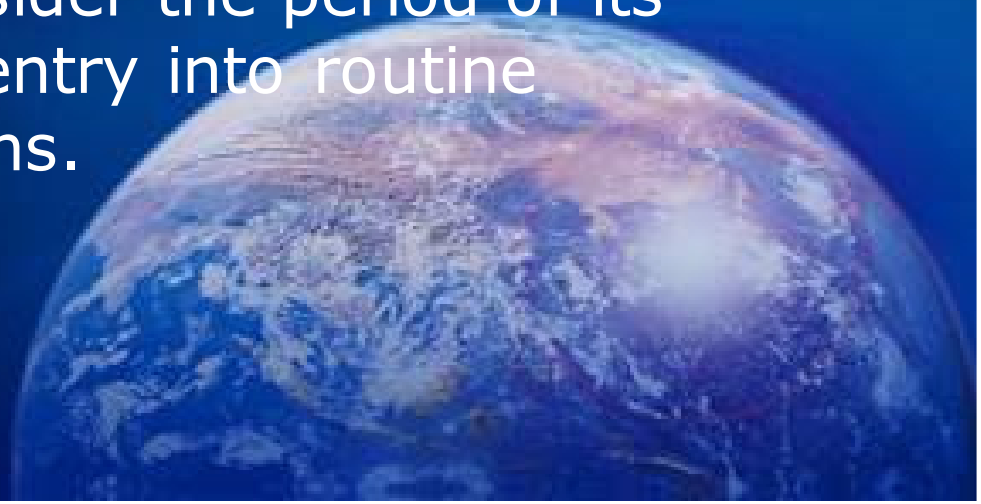
- Help decision making process about medium term stratigies of Lubango water supply. Population rised from 50.000 hab to 731.000 from 1970 to nowadays.
- Capacity building of two graduate students with master degree
- Comparing actual data with data of the past in order to calculate climatic trends.



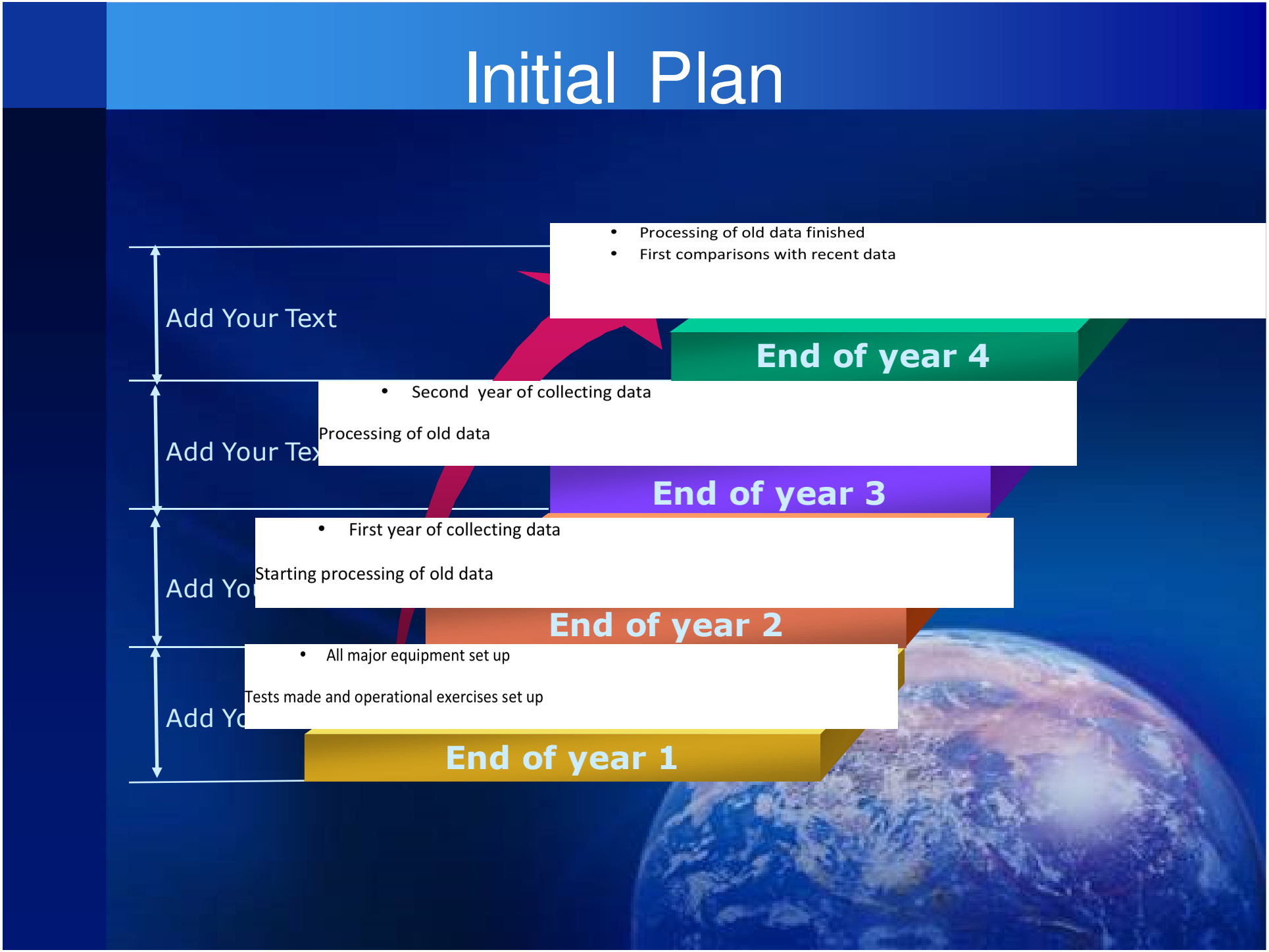
Time Frame

- This is a work settled on a permanent basis, which is intended to become part of the National Network to collect weather information that is already planned and partially implemented.

- For this reason the time frame of the project is far beyond the normal course of SASSCAL intervention. We consider the period of its implementation and entry into routine operation in 30 months.



Initial Plan



Development

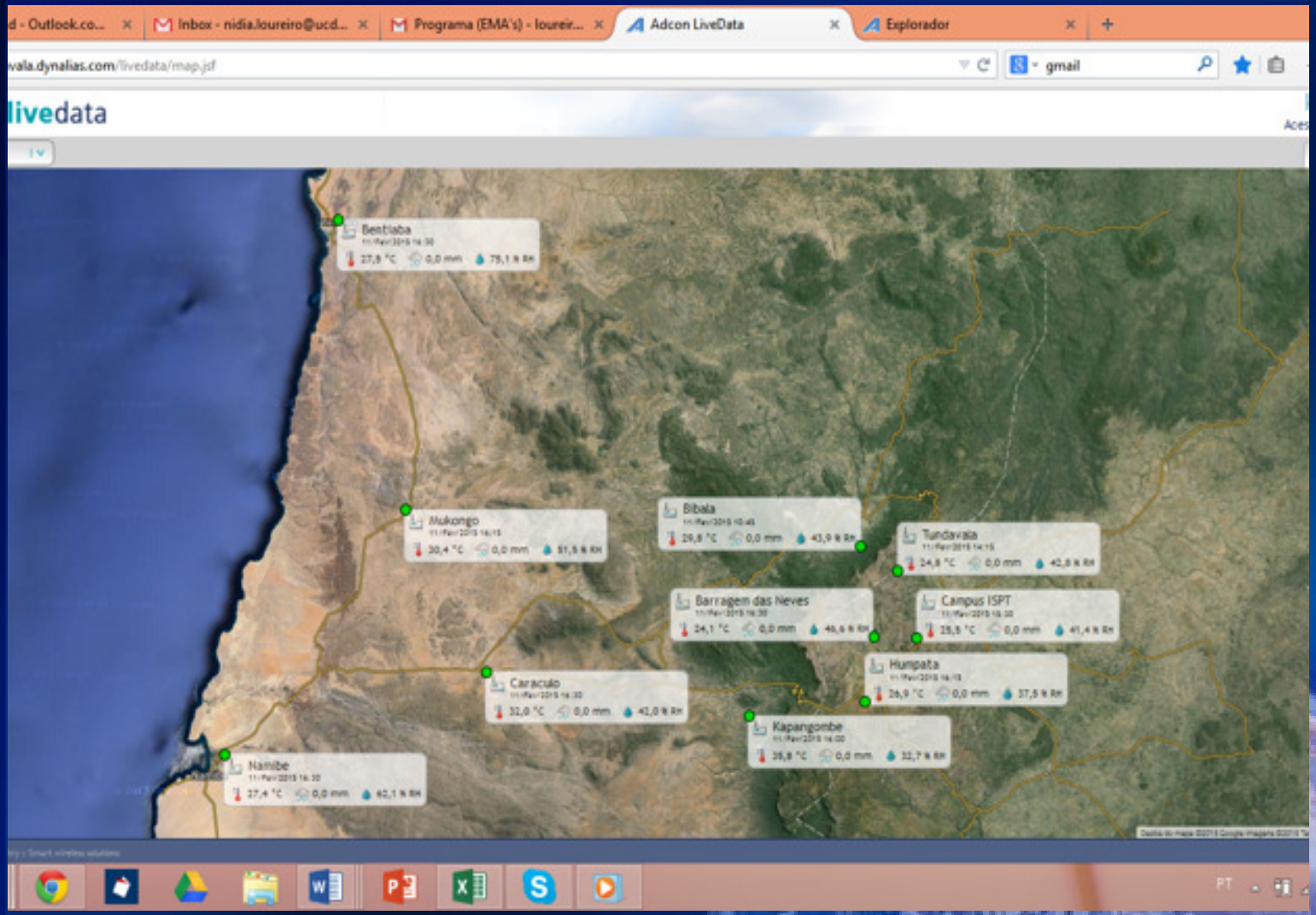
The research activities are enrolled in making past data (1960-1974) more useful, considering the all region trough digitalization and mapping.

This data was kindly supplied by the Geophysics Institute of University of Coimbra, Portugal, which received all the data of weather stations of Angola
for the period.

Development

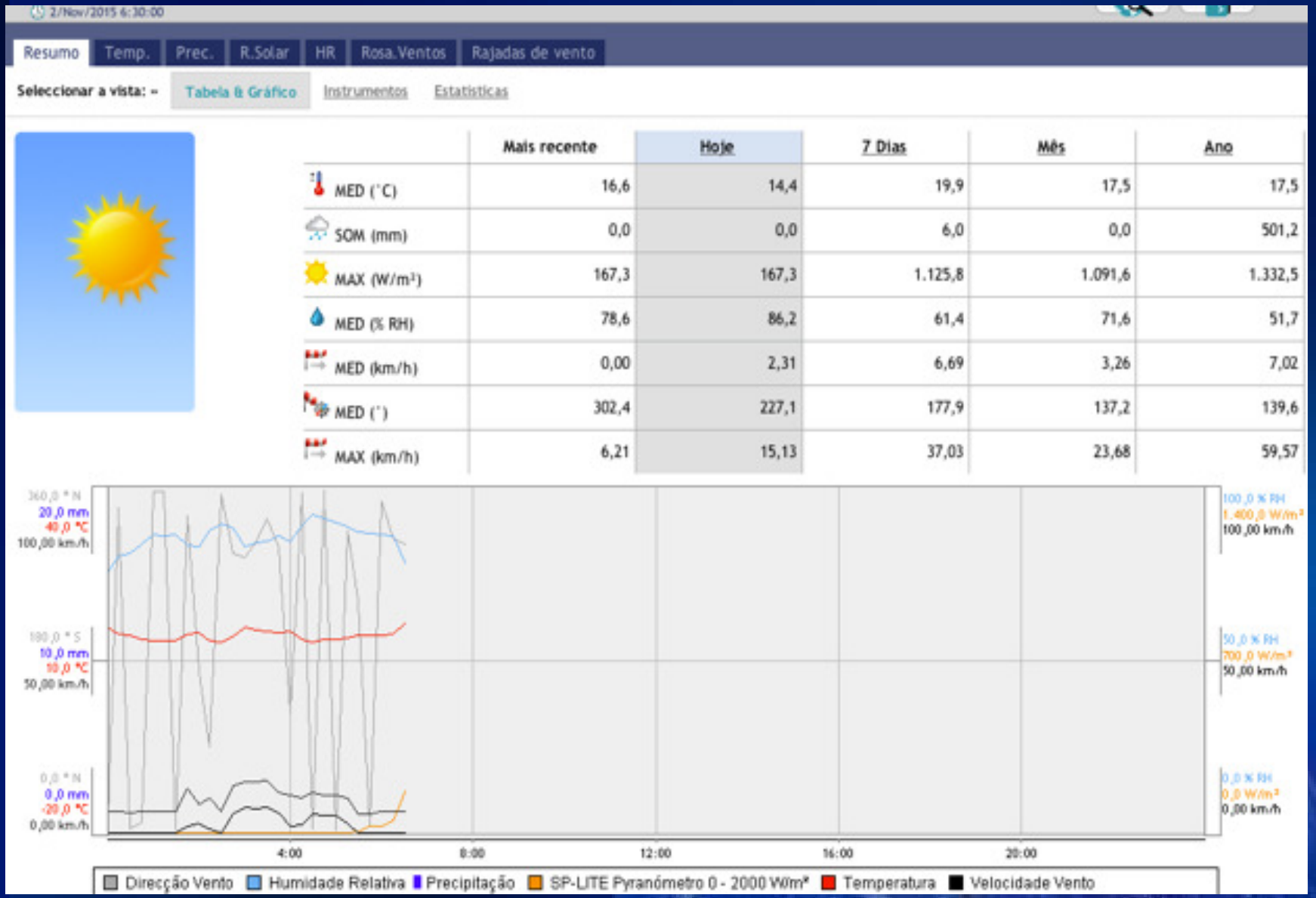
- Installation of one of the 10 initial AWS (October 2014).

Development (October 2014)



Development (March 2015)

Preliminary Results



Preliminary Results

2/Nov/2015 6:30:00

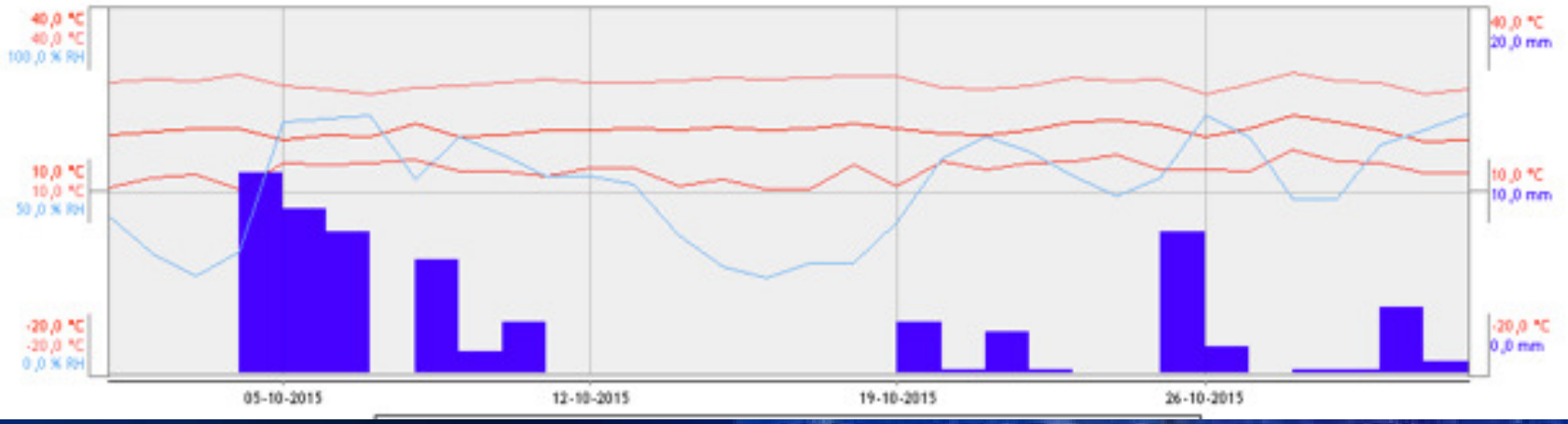
Resumo | Temp. | Prec. | R.Solar | HR | Rosa.Ventos | Rajadas de vento

Seleccionar a vista: – Tabela & Gráfico | Instrumentos | Estatísticas — Exportar:

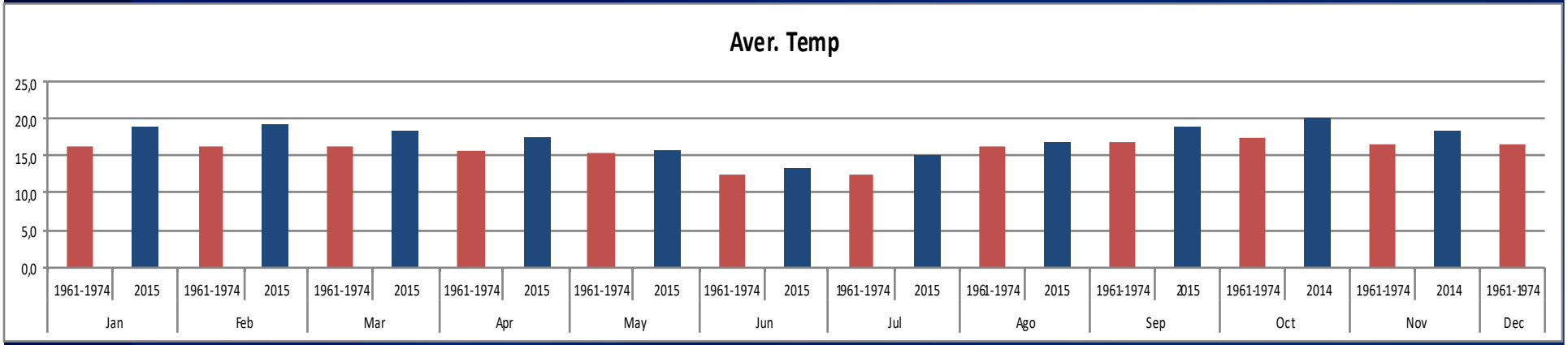
2014 2015

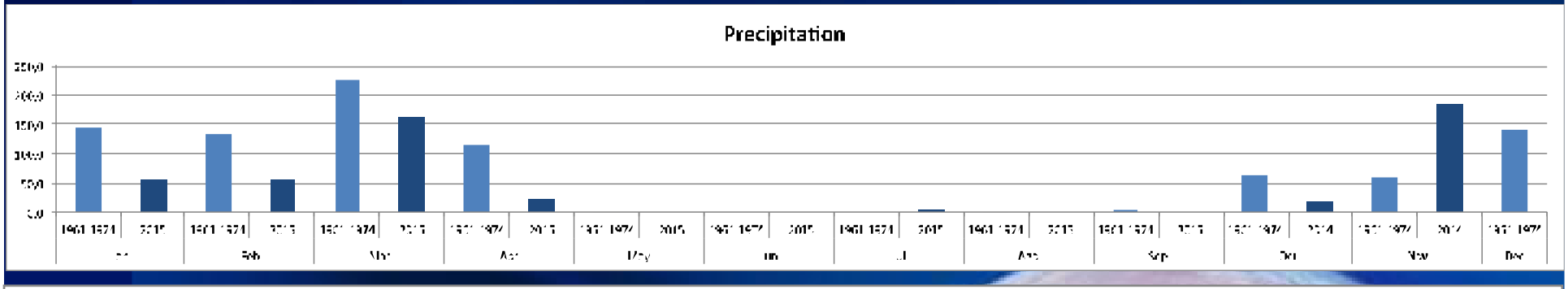
Jan Fev Mar Abr Mai Jun Jul Ago Set Out Nov Ano

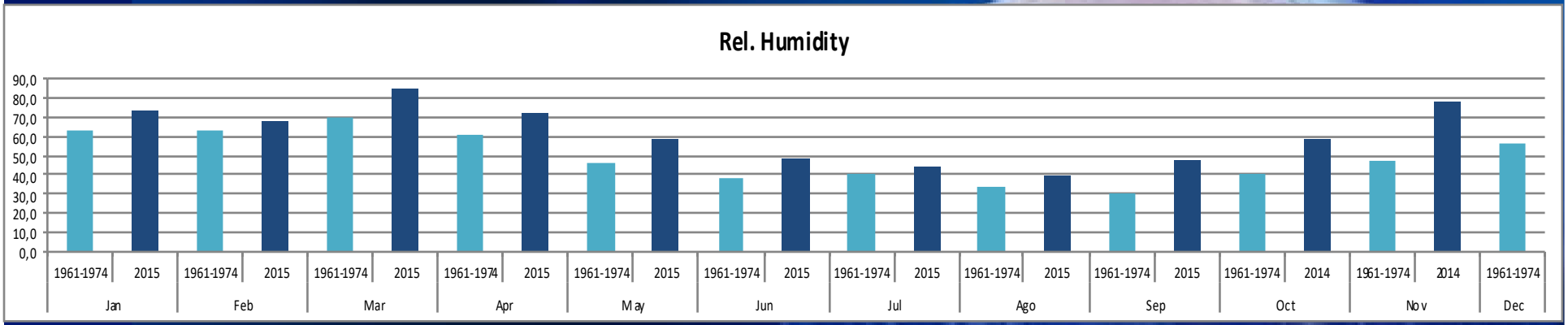
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	2	Outubro
AVG (°C)	19,8	20,3	20,5	18,4	19,4	19,0	21,2	19,0	19,2	20,1	20,2	20,5	20,2	20,6	20,2	20,4	21,1	20,4	19,6	19,4	20,1	21,4	21	20,1
MIN (°C)	12,1	12,7	10,4	14,6	14,4	14,8	15,3	13,3	13,3	12,5	13,8	13,9	11,0	12,1	10,4	10,3	14,5	10,9	15,0	13,6	14,6	15,0	16	10,3
MAX (°C)	28,6	28,3	29,3	27,5	27,0	26,0	27,1	27,6	27,9	28,6	28,0	28,1	28,2	28,8	28,6	28,9	29,1	29,2	27,1	26,8	27,5	28,9	28	29,5
SUM (mm)	0,0	0,0	0,0	11,0	9,0	7,8	0,0	6,2	1,2	2,8	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	2,8	0,2	2,2	0,2	0,	57,2
AVG (% RH)	32,9	26,4	33,4	69,0	69,8	70,8	53,4	65,2	60,1	54,2	54,4	51,8	37,9	29,3	26,3	30,2	30,0	41,6	58,9	65,1	61,1	54,4	48	52,0
MIN (% RH)	15,2	12,1	14,3	33,9	33,6	39,3	29,8	34,0	33,3	24,4	24,0	16,9	17,8	13,2	16,3	16,6	14,7	22,0	32,0	35,3	30,5	26,0	26	12,1
MAX (% RH)	57,6	45,8	70,8	100,0	99,9	99,2	87,3	99,7	89,3	96,8	89,1	89,7	63,4	46,4	46,8	48,6	65,1	82,8	93,4	92,7	89,5	95,8	77	100,0



Preliminary Results (Humpata)



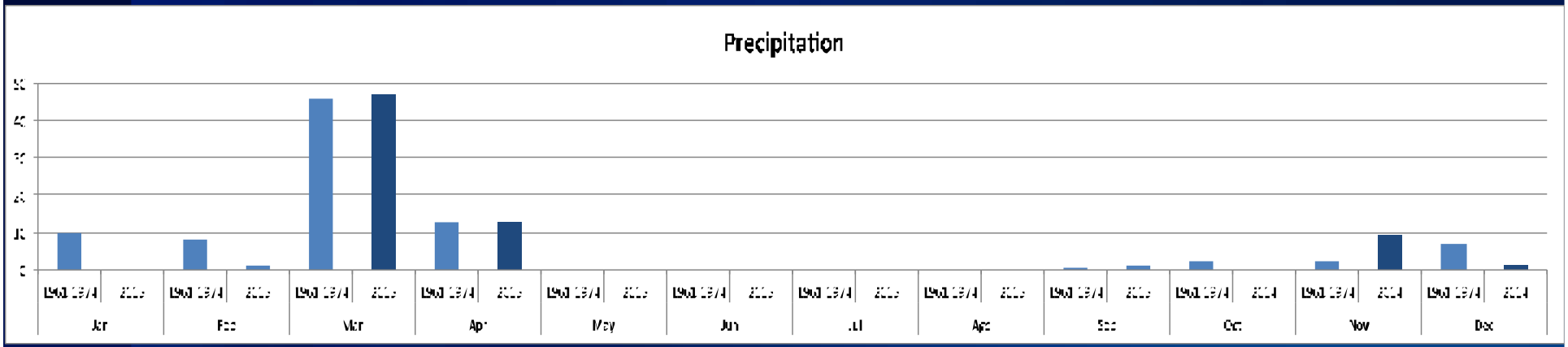


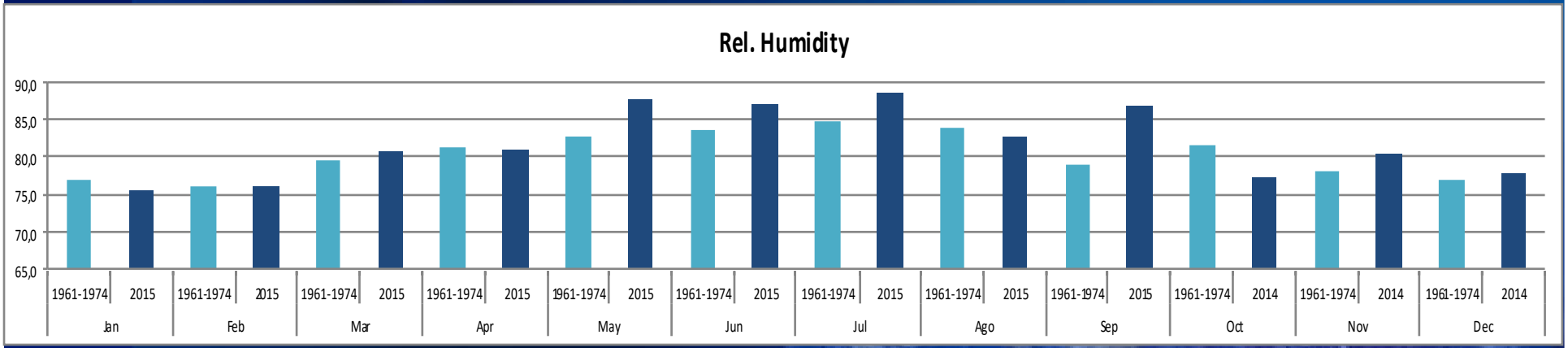


Preliminary Results (Huíla)

- The year 2014-2015 had higher mean temperatures then the series 1961-74.
- The max. temperature was slightly higher in last year and min. temperature in the cold months was a bit lower than the one of old data series.
- Rel. Humidity was higher in all months of last year when compared to old data series.
- The total amount of rainfall last year was similar to the ones of the past. However, rainfall was much more concentrated, from end October to April. In the old series, rain season began in September till May.

Preliminary Results (Bentiaba)





Preliminary Results (Namibe)

- Bentiaba had higher mean temperatures last year then old series data, and also higher rel. humidity, mainly in "cacimbo" months. Also, the Min. temperature was higher, like Caraculo, last year then old series data.
- The pattern of rainfall was similar to all WS, a more concentrated rain season, but with similar year amount.
- Those are preliminary results, with just one year to compare. We have to wait more years to have a better understanding about the trends in climate in this region.

Dificulties

- We had several problems of maintenance, namely in Bentiaba, with a battery and Namibe with a sensor of temperature. Also, in the AWS of Caiundo the transmission of data is not working do to Unitel. We have to go there every 6 months to collect the data.

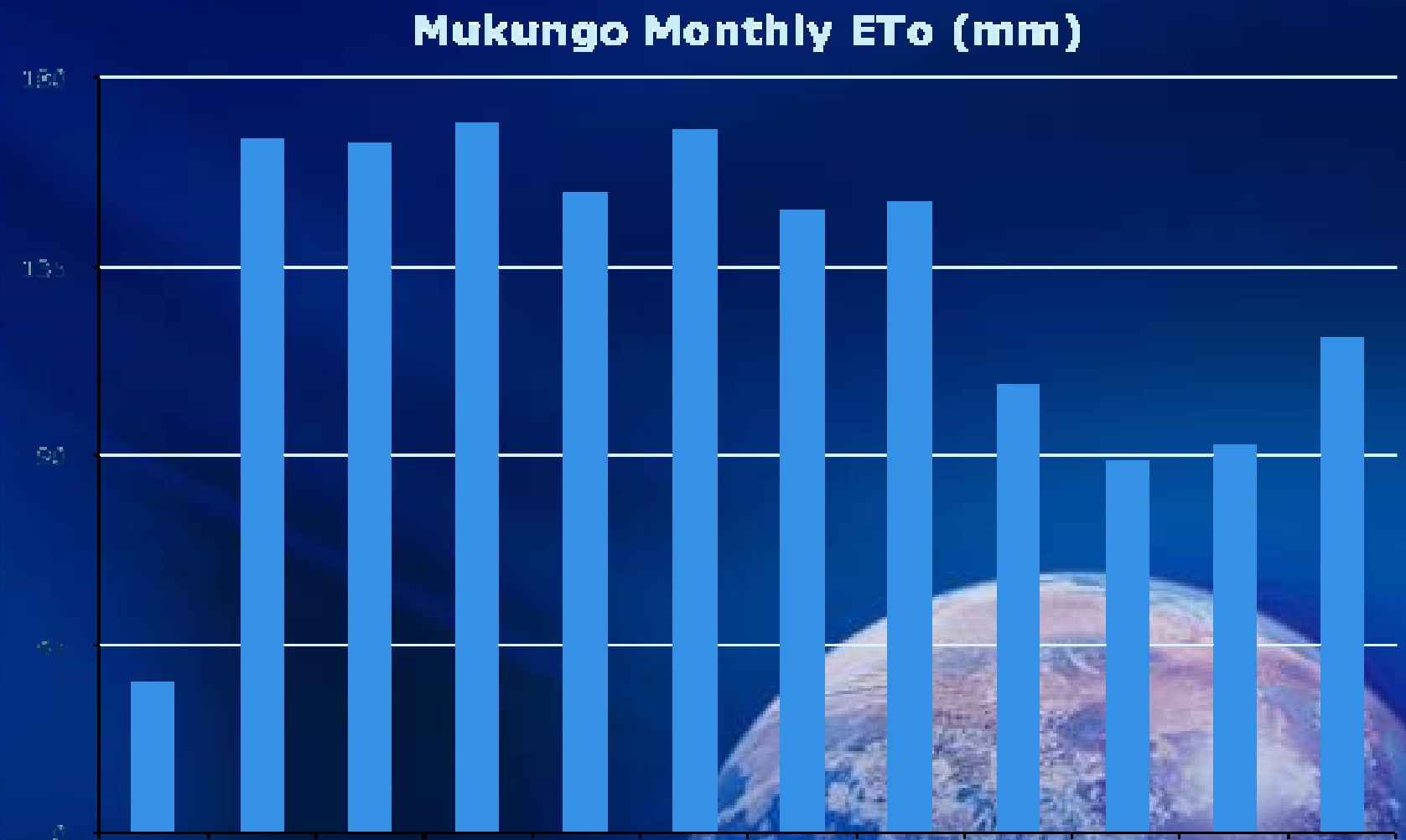
Link to Other Projects

1. Other Organization and Projects in Southern Africa

2. Research work about climate in the Cuvelai Region

3. TFO Project concerning the climate in the southeast region of Angola, Namibia and Botswana

Further Steps



Further Steps

- **Development of a Network of Meteorological Stations**
- **Development of an integrated environmental monitoring and early warning service for southern Angola**

Development of a Network of Meteorological Stations

- 1. Expansion of meteorological stations network
- Since 2007, mainly the Ministry of Agriculture installed a series of meteorological stations all over Angola, but most of these stations ceased to operate due to a lack of maintenance. This project proposes to collect all data that has been recorded by these stations and to reactivate and maintain those stations that can be repaired.

Development of a Network of Meteorological Stations

2. Digitization and storage of historical data

- Under task 141, the digitization of meteorological data of 200 stations for the period of 1961-1974 is about to be completed. This project suggest to continue the digitization of historical data, by accessing the archives of NOAA (data from 1910-1946) and the libraries of Coimbra and University of Lisbon (data from 1937-1952). The project will then have digitized and archived all existing meteorological data on Angola.

Development of a Network of Meteorological Stations

- Project outcomes:
- By simultaneously expanding the existent network of meteorological stations and creating a comprehensive record of historical data, the project will be in a position to initiate the comparative analysis of historical and contemporary climate data and identify trends and changes over the time span of approximately 100 hundred years. For the storage of the historical data the project will create an OCR database and data will be shared with partners such as SASSCAL, WMO, INAMET, NOAA, and others.

Development of an integrated monitoring for southern Angola

- Development of a remote sensing component through which critical bio and physical conditions are monitored, especially soil moisture, crop growth, pasture production and surface water. First contacts have been made with EUMETSAT's GEONETCast which is a global network of satellite-based data dissemination systems providing environmental data. The network's specifically developed ILWIS GIS software would provide a user specified gateway for the remote sensing information needed for this project.

Development of an integrated monitoring for southern Angola

- Field assessments for the verification of remote sensing data and analysis.
- Training of students for environmental conditions monitoring through which final year environmental students of ISPT will be involved in the project.
- Development of a monthly newsletter providing synthesized weather and other environmental information to relevant institutions locally, regionally and internationally.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