SUMMER MEAN FIELDS OVER TROPICAL AFRICA, INDIAN AND ATLANTIC OCEANS DURING EL NIÑO AND LA NINA YEARS

PIC.1

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ABSTRACT

The summer mean fields over tropical Africa, the Indian and the Atlantic Ocean have been investigated during the years of 1997 and 1998. The study was aimed at comparing the oceanic conditions associated with El Niño and La Niña events using the climatological year reanalysis project. Bull. 43(6), 614-272.

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The authors wish to express their deep gratitude to the Geophysical Research Laboratory, for the dataset used in the present study. The NOAA/ESRL Physical Sciences Division, Boulder Colorado, U.S.A has provided these dataset from which we have prepared the present study.

REFERENCES

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RESULTS AND CONCLUSION

The 1997/98 El Niño event has been linked to the El Niño of the 20th century. El Niño conditions begin to appear on February and continue to December 1997, while La Niña conditions begin to appear on February and continue to December 1998. The tropical Easterly Jet (TEJ) has been observed stronger and occupied larger areas during summer of 1999 (La Niña) than those observed during summer of 1997 (El Niño). The Tropical Easterly Jet (TEJ) has been found stronger during 1998 and 1999 than those observed during 1997. Also, during 1998 and 1999 the TEJ has been found to extend more westward than during 1997. Therefore, the most possible mechanism through which El Niño and La Niña conditions may affect the climate of Africa and nearby regions is the variations in the tropical region, notably over Africa. This is of great importance to Egypt since these climatic variabilities are the controlling factors causing variation of Nile flood.

DATA AND METHODOLOGY

The 1997/98 El Niño and 1998/99 La Niña in the tropical Pacific Ocean have been investigated during the years of 1997 and 1998. During summer of 1997, while El Niño conditions were dominant, the Atlantic Ocean experienced normal conditions. During summer of 1998, while La Niña conditions were dominant, the Atlantic Ocean experienced normal conditions. Overall, normal conditions prevailed during 1997 and 1998 in the tropical Pacific Ocean and the Atlantic Ocean.

ANALYSIS AND DISCUSSION

El Niño phenomenon during various oceanic conditions in the tropical Pacific Ocean will be discussed in this study. For sake of simplification, only SST anomalies will be discussed, for each year, the study was aimed at comparing the oceanic conditions associated with El Niño and La Niña events using the climatological year reanalysis project. Bull. 43(6), 614-272.

El Niño conditions may affect the climate all over India and eastern tropical Atlantic. Strongest easterlies cover a wide latitude band over Indian Ocean and eastern tropical Atlantic. So, the more zonal advective conditions may enhance the deep moist convection and trigger heavy rainfall. However, the weaker and localized advective conditions may lead to dry conditions and decrease in rainfall.

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El Niño and La Niña conditions may affect the climate of Africa. Negative anomalies of precipitation over eastern equatorial parts of the Pacific Ocean during 1997, while positive anomalies during 1998. In addition, the western tropical Atlantic Ocean has been found to experience normal conditions during 1997, while positive anomalies during 1998. The impact of these anomalous conditions have been investigated during 1997, which has been found to be stronger during 1998. The results showed that intrusion of the TEJ has been observed stronger and dominated tropical Atlantic Ocean during summer of 1997, while during 1998, the TEJ has been observed stronger and dominated tropical Atlantic Ocean. So, the more zonal advective conditions may enhance the deep moist convection and trigger heavy rainfall. However, the weaker and localized advective conditions may lead to dry conditions and decrease in rainfall.

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