

TORNADO AND WATERSPOUT CLIMATOLOGY IN BRAZIL

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I. INTRODUCTION

This study provides an overview of tornadoes and waterspouts in Brazil during the period 1991 to 2010 in view of identifying sites and periods of highest incidence of these phenomena and recognize which characteristics of atmospheric and of other nature are associated with tornadoes and waterspouts in the country.

II. DISCUSSION

Some studies on tornadoes and waterspouts recorded in Brazil stress out that some relief features are fundamental in the formation of tornadoes, and that many tornadoes in central-southern Brazil follow river courses from which they get energy. Further, in sectors of central-southern Brazil the influence of the Subtropical Jet Stream is also clear.

FIG. 1 presents proven tornadoes and waterspouts in Brazil between 1967 and 2010. An increasing trend in the number of reported events can be noted, probably due to the facility to document these episodes and to the growth of urbanization and population in several areas of the country.

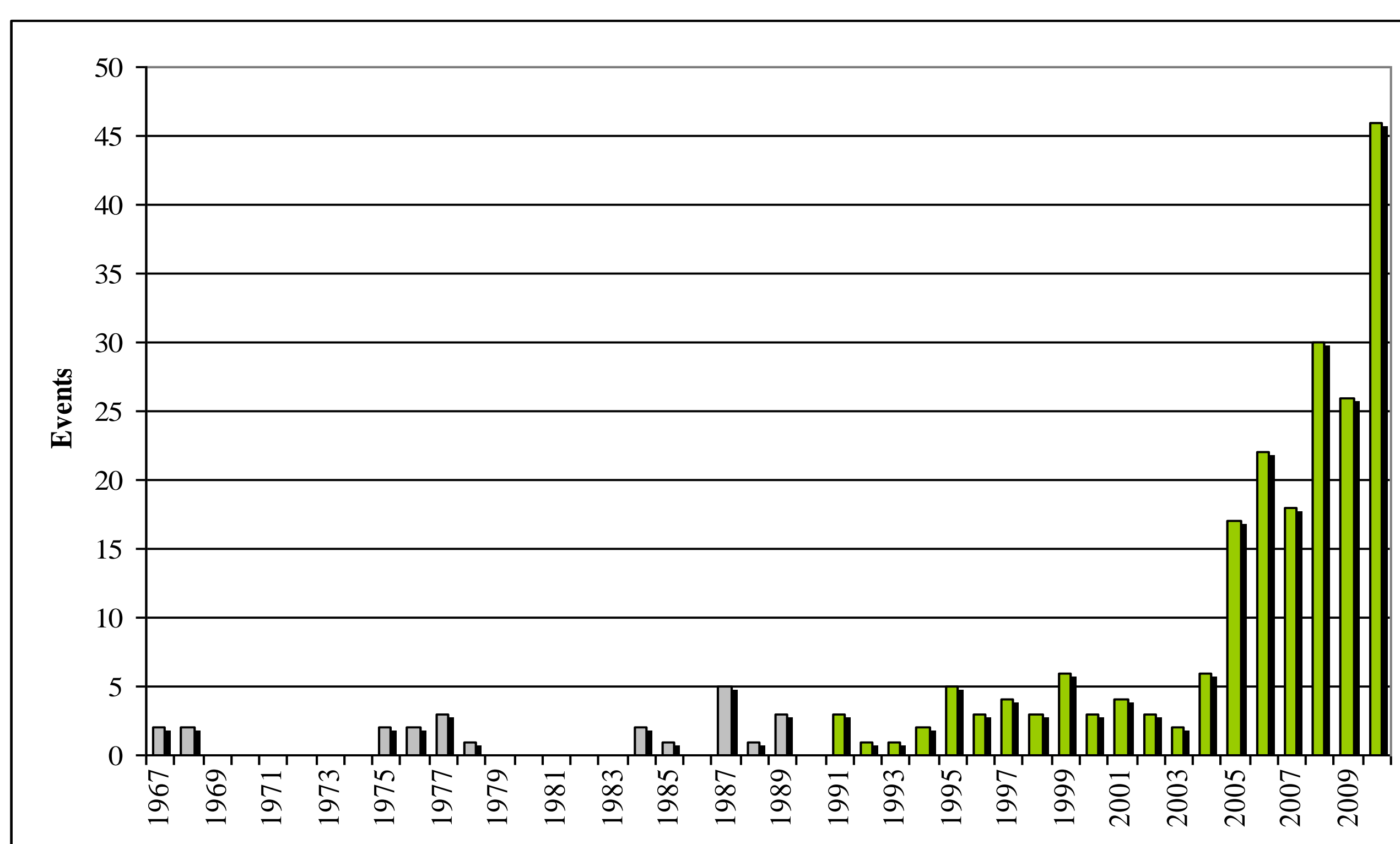


FIG 1: Yearly distribution of events from 1967 to 2010 – in gray, events prior to 1991-2010 (Organized by Laura De Bona)

In the period of analysis (1991 to 2010) 167 tornados and 38 waterspout were identified, totaling 205 events, and sixteen of them involved deaths (52 casualties). FIG. 2 shows that the highest concentration of events took place in the hottest period of the year, between September and March.

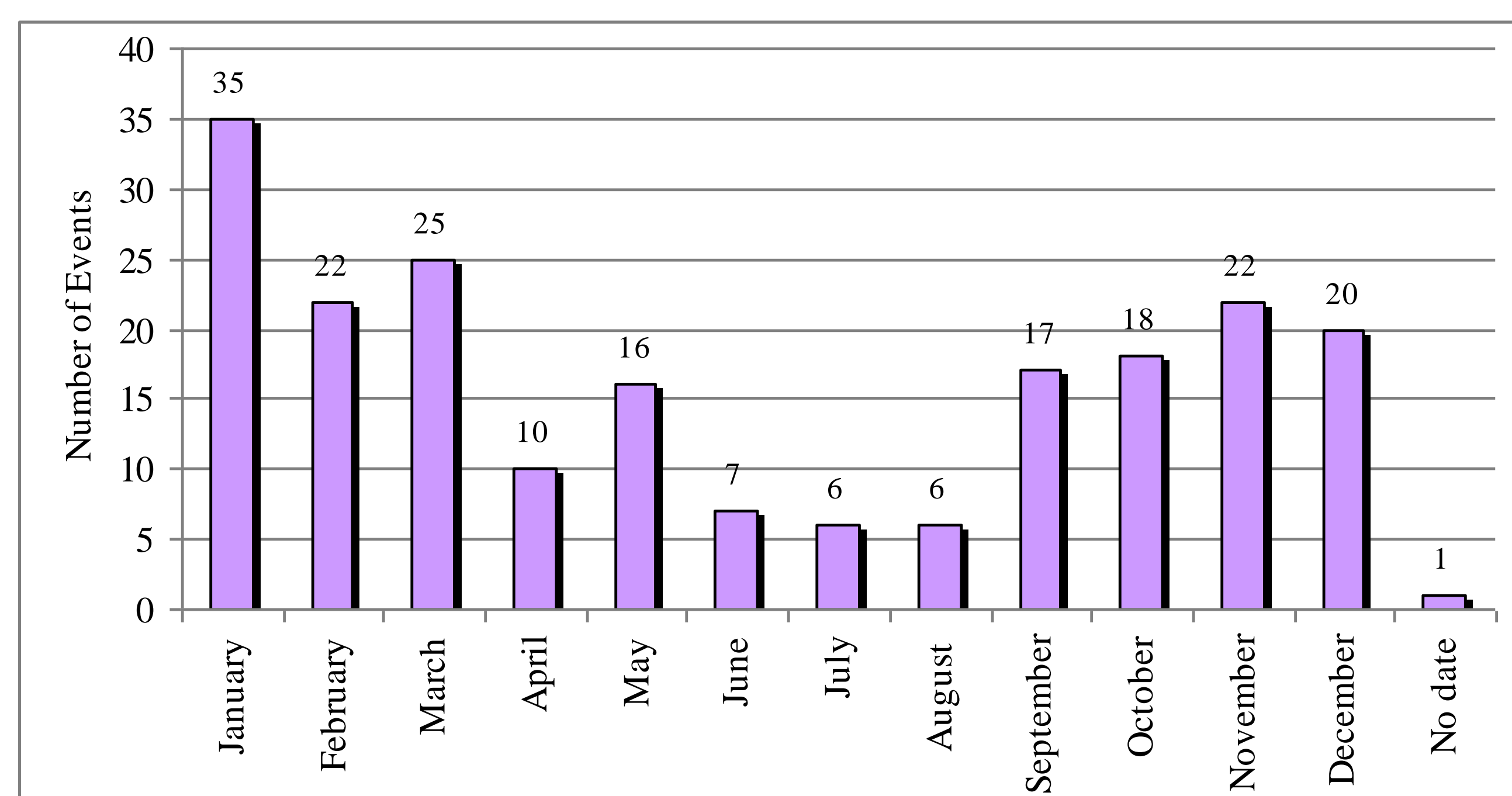


FIG 2: Monthly distribution of events (1991-2010) (Organized by Laura De Bona)

Although 16 states recorded tornadoes or waterspouts (FIG. 3), 81% of the episodes occurred in the southeastern and southern regions, where the Jet Stream, the topography, the distribution of the drainage and humidity are decisive contributors to these disturbances.

Further, because these regions concentrate an important part of the income and of the population of the country, the social-economic consequences generated by these disturbances can be quite acute.

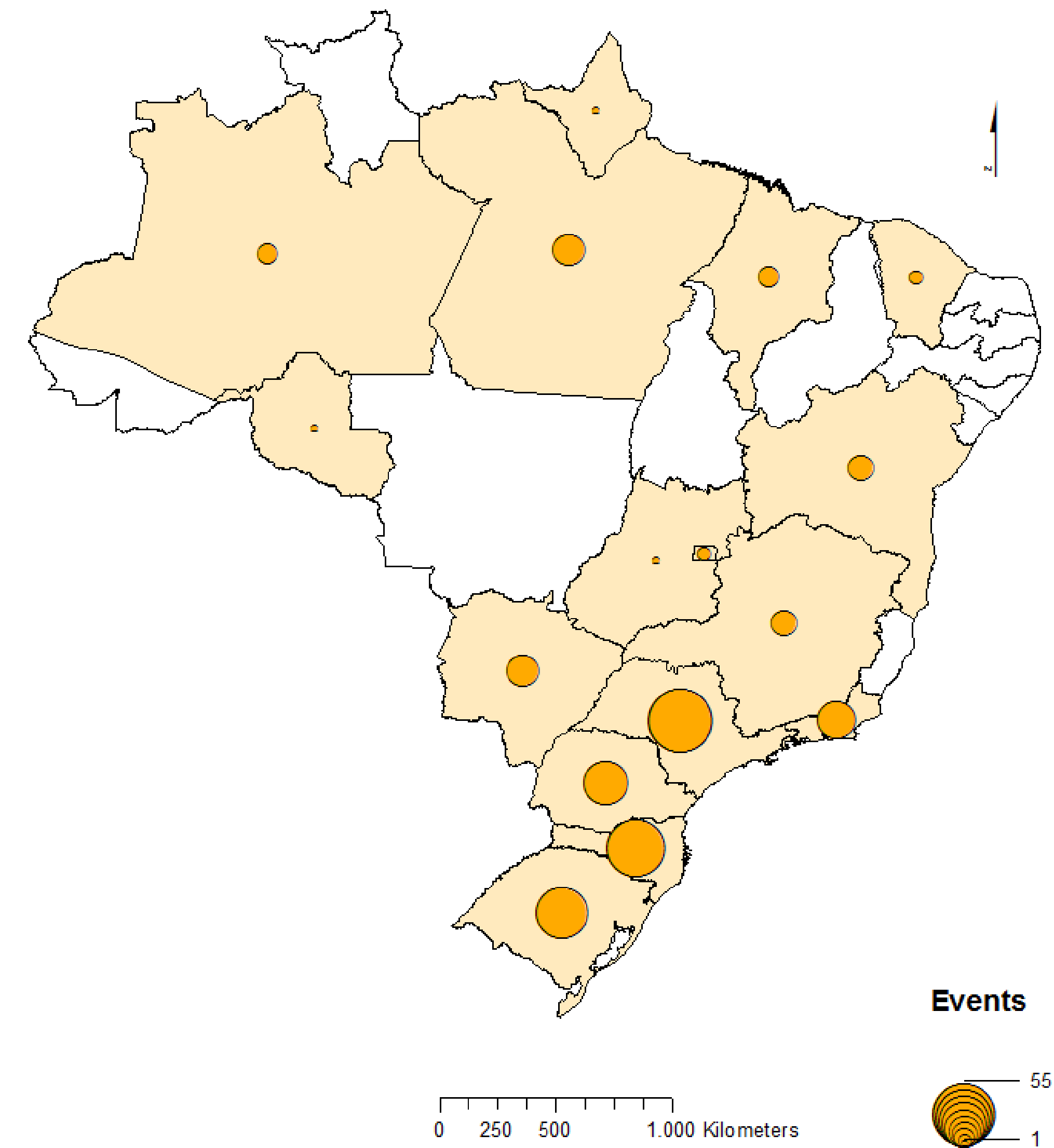


FIG 3: Distribution of the events by state between 1991 and 2010 (Organized by Laura De Bona)

III. RESULTS AND CONCLUSIONS

The scarce scientific literature on tornadoes and waterspouts in Brazil limits the recognition that the country is an active tornado-prone area, notably in the central-southern region. In this sector a number of aspects such as the meeting of tropical and polar air masses, the position of the Jet Stream and geographic features such as relief and hydrography are fundamental to the occurrence of tornadic storms.

It is possible that many of the episodes were severe, taking into consideration their destruction. In addition, a number of occurrences seem to be associated with not only one, but with several, more or less simultaneous tornadoes.

IV. ACKNOWLEDGMENTS

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