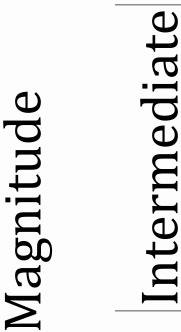


Hydrological events

Minor flooding, single and short-lived events as pondings, Small landslides induced by human activity (modificated water overtopping roads up to 1 meter, and/or events slopes, cuts and landfill), artificial slopes breakdown resulting in small damage over streets/neighborhoods; and/or events resulting in punctual impacts; Local Local government is able to cope with the event without government is able to cope with the event without requests requests for state or federal support; There is small or any for state or federal support; There is small or any damage damage or number of victims. or number of victims.



Small

Moderate floods and flashfloods reaching several buildings Sparse landslides over a neighborhood or region within the with moderate damage over larger areas; Local government municipality, significant amount of soil displaced, natural requests for state or federal support to cope with the event; slopes breakdown; Local government requests for state or There are significant damages or number of victims. federal support to cope with the event; There are significant damages or number of victims.

Major flooding covering entire buildings over wide areas; Widely distributed landslides within municipality resulting events that resulted in high impacts as large amount of in impacts over the whole municipality or region and/or homeless, injured or fatalities; Significant evacuation of large amount of soil displaced, natural slopes breakdown; people and/or transfer of property to safer areas are Significant evacuation of people and/or transfer of property needed; Local government requests for state or federal to safer areas are needed; Local government requests for support to cope with the event, including state of state or federal support to cope with the event, including emergency. There are large damages or number of victims. state of emergency. There are large damages or number of victims.

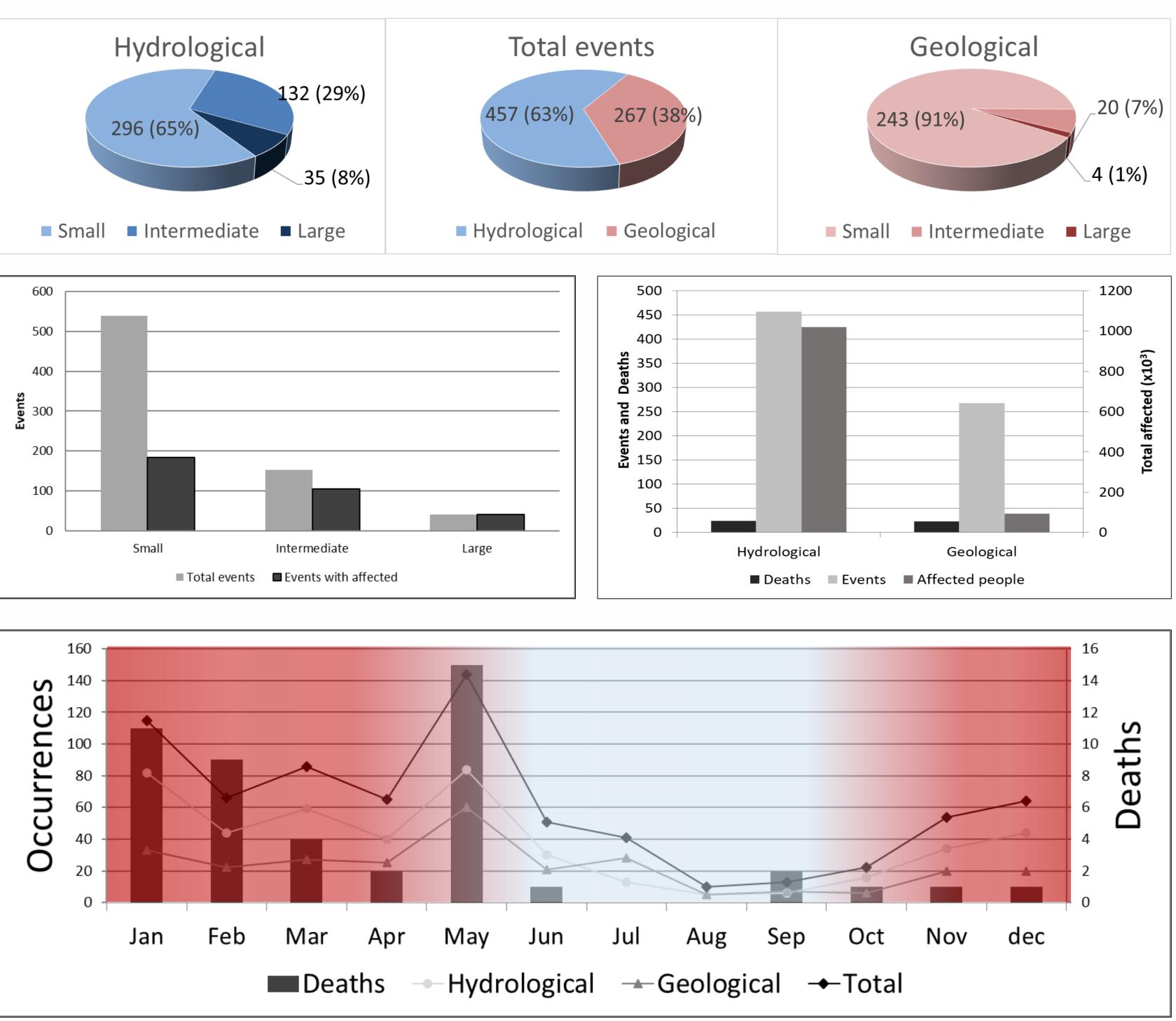


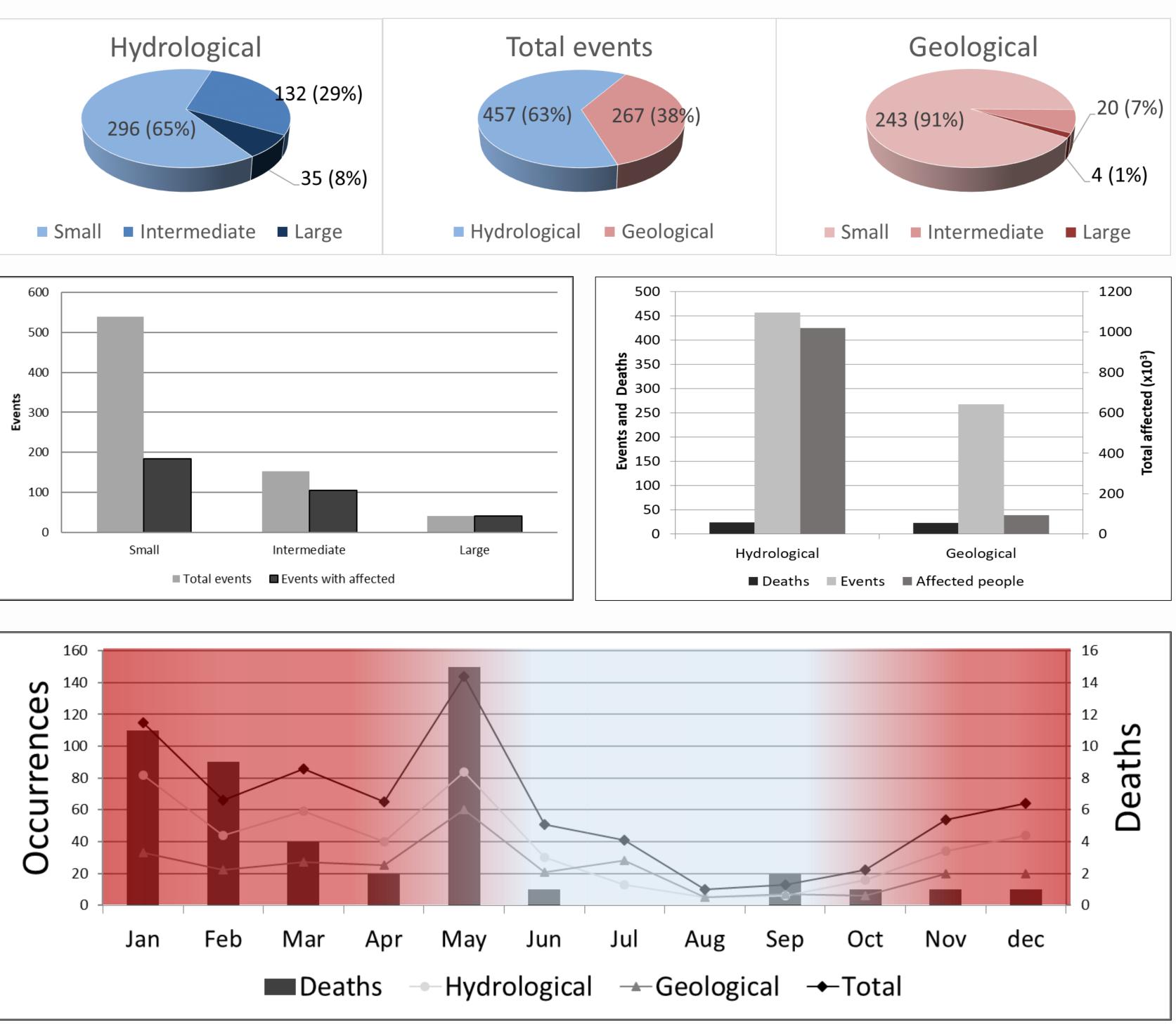
arge

FLOOD AND LANDSLIDE EVENTS DATABASE FOR THE MUNICIPALITIES MONITORED BY BRAZILIAN **CENTER FOR MONITORING AND EARLY WARNINGS OF NATURAL DISASTERS – CEMADEN**

Geological events

Tiago Bernardes – PhD Remote Sensing





Remarkable conclusions

In the year of 2017 flood events resulted in more than one million (1,019,640) affected people and landslides affected almost one hundred thousand (94,642) people. While the number of floods almost double the number of landslides and impacted 10 times more people, landslides caused virtually the same number of fatalities – 23 deaths from landslides and 24 deaths from floods. The most of events (594) took place from January to May and November/December which corresponds to the rainy season in most of the country. From June to October they were registered only 137 events mainly on North and part of Northeast region where the rainy season occurs those months.

