with an oncoming wet period and use a Δus of 1.6pF. This would increase the y_s value by about 13% and possibly a whole classification higher. Using figure 15 and an average I_{ps} of 4.7% this y_s would be ≈95mm and y_m ≈57mm.

In all climate conditions the models can also be modified to allow for varying Hs, Ueq and Δus values. It should also be noted that, due to the effect of the curvilinear relationship, the Ips values are higher at <4pF and lower at >4pF, therefore Ips values should be calculated from two tangents as in figure 6.

6 CONCLUSIONS.

The investigations for this paper have been carried during a fortuitous period which included the Millennium drought that lasted 20 years but interrupted by two one year long 'transitional' periods. From mid-2010 there were two consecutive flooding years followed by 3 short droughts which were interrupted by short 'transitional' periods culminating in the Black Summer bush fires in 2019-2020 and a wet La Nina event from late 2020 to the present.

The aim was to gather data about surface suction variation, house concrete slab performance and, soil moisture to determine whether new and extended models in AS2870 could be designed for the characterization of ground foundation movement in an increasingly chaotic climate.

The results from 5 investigations were compared and new models presented for 'normal' and 'abnormal' foundation moisture conditions by extending the AS2870 methodology.

The results of this research indicated the following:

a) The Millennium drought and the very wet period that followed, caused considerable damage to many thousand houses in the reactive clay areas in Australia.
b) The AS2870 classification model designed in the 1980's was not adequate for recent climatic conditions and controlling authorities have not made the necessary changes to AS2870.
c) The site preparations practices have never been adequate since the expansion of subdivisions into highly reactive clay areas and reduction in allotment size.
d) AS2870-2011 has not been reviewed since it was completed in 2009 and the building industry has missed all the warnings given by many practitioners in the late drought and the information learned from the flood of 2011 and since.
e) This paper proposes a few solutions worth considering especially for problems on sites with 'abnormal' moisture condition and reactive clays in Australian conditions.
f) The authors recommend further research into the relationship of TMI, and Hs depth, damage contribution by inflexible pipes and the effect of chemicals of water home discharges in highly expansive or soft soils is warranted.

7 ACKNOWLEDGEMENTS.

The authors thank those that have contributed to this paper with personal data and observations including Mr Jason McCloud, Mr Russel Brown, Dr Aruna Karunarathne & Mary Levy.

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