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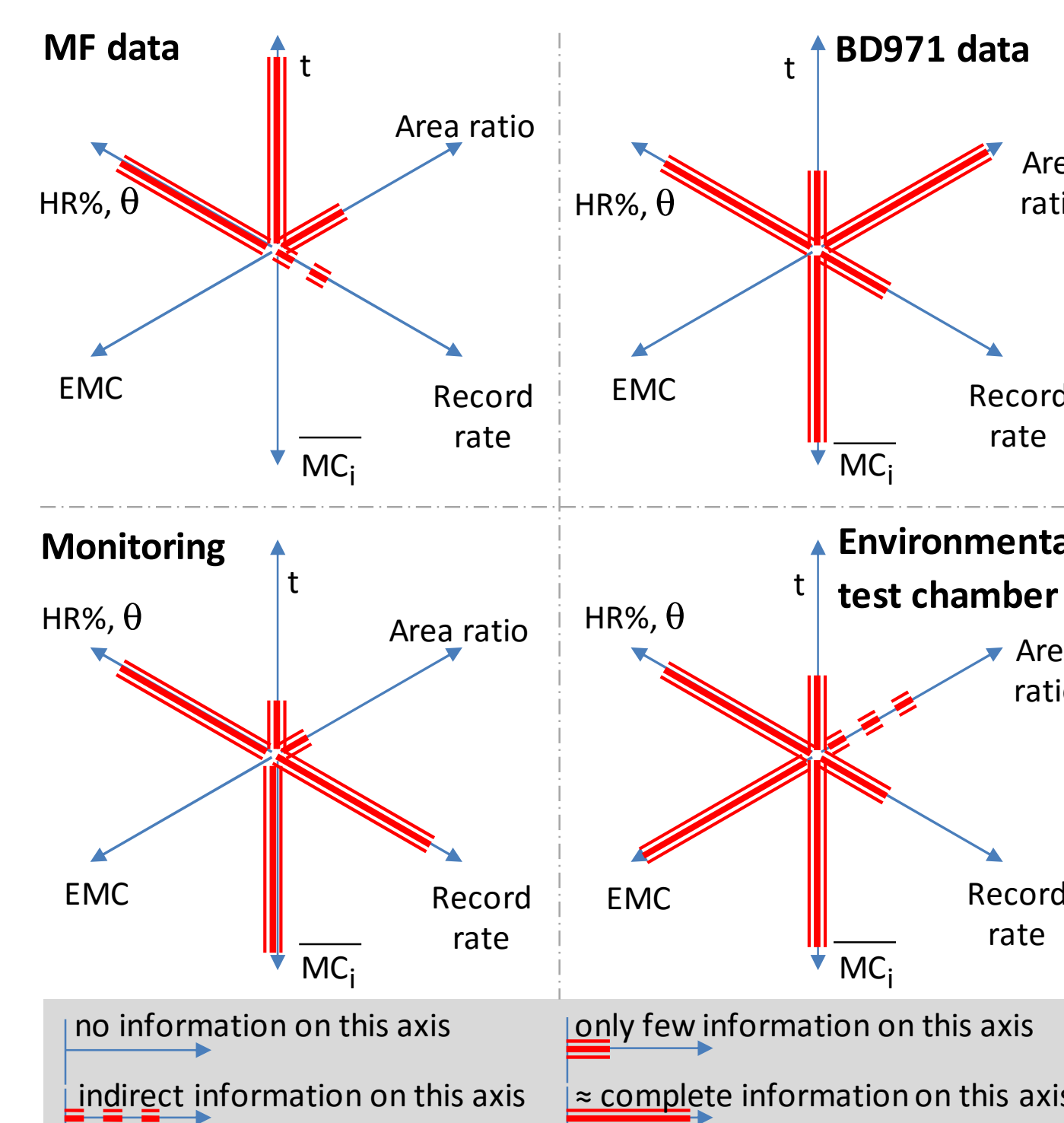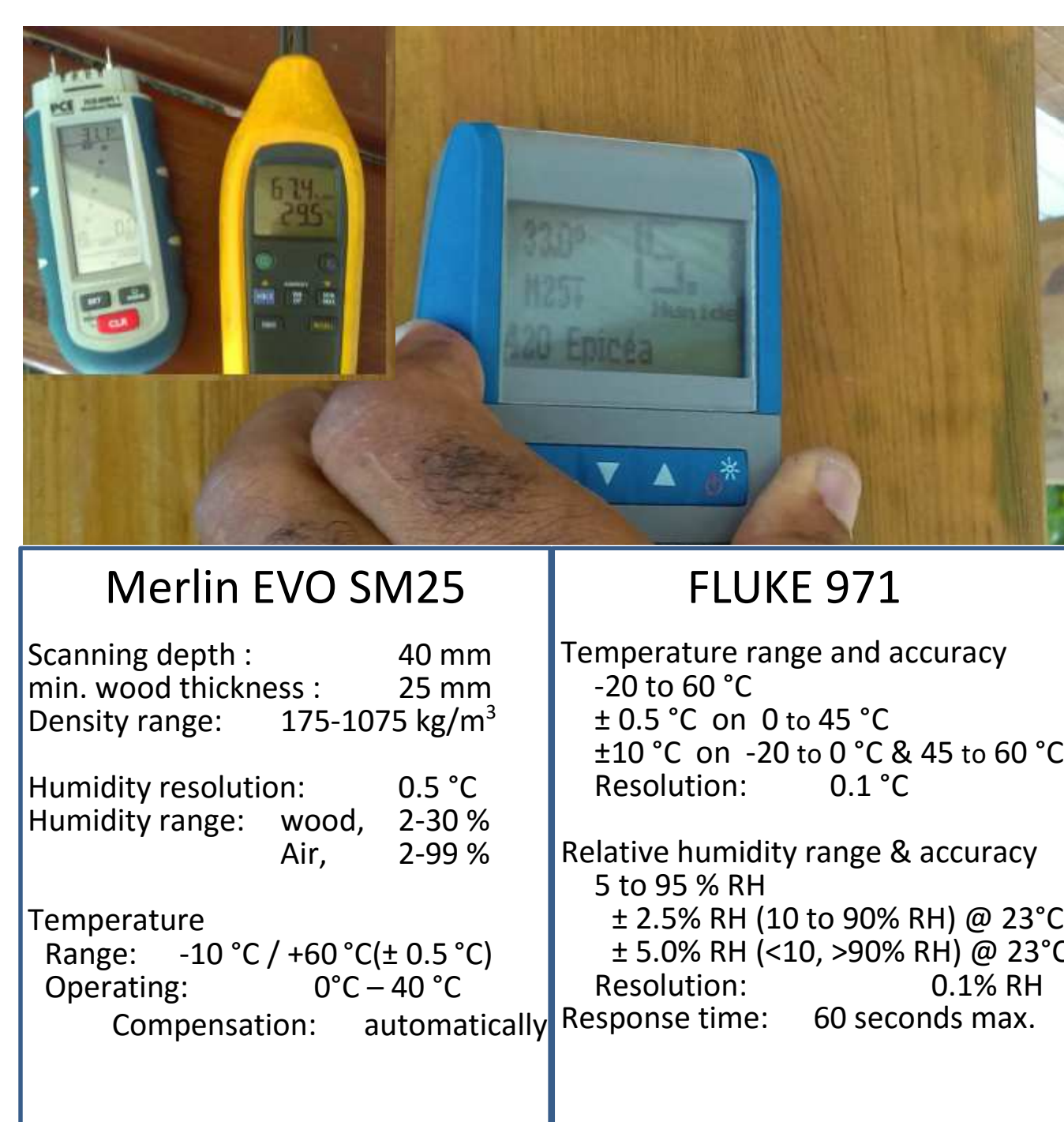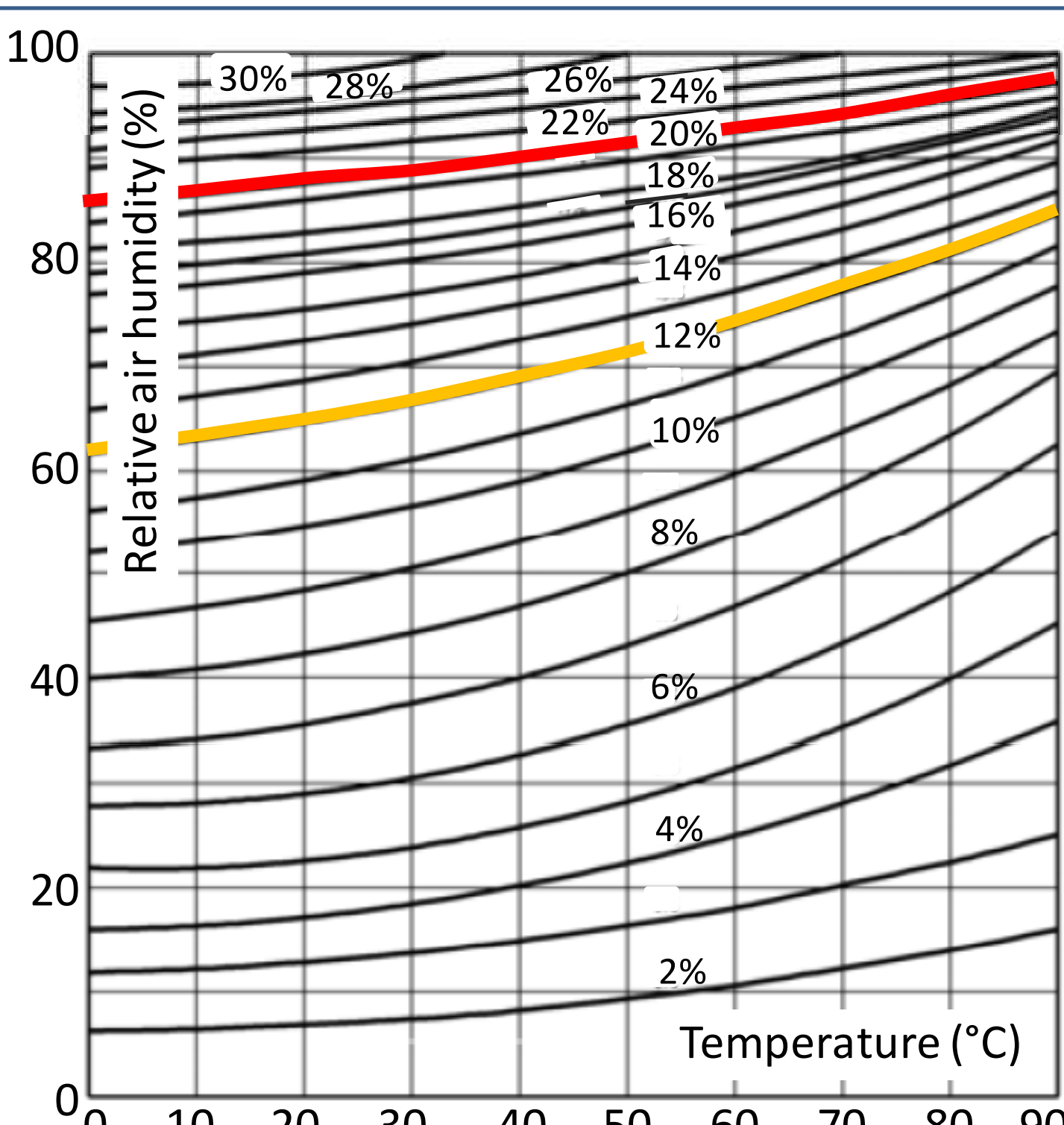
IMPACT OF ENVIRONMENT ON TIMBER STRUCTURES, BOIS DURAMHEN 971, THE CASE OF GUADELOUPE (FWI)

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FWI context

oden house is a traditional mode of construction in the Caribbean Islands. The buildings have to face hurricanes, earthquakes, high level of humidity and temperatures. Regarding Eurocode standard dedicated to timber structures, EC5, French west indies islands are often considered as a service class 3 area (the er environmental conditions). This decision is mainly based on a lack of information on the real local climate and its consequences on timber elements of buildings. al of the European project, Synergîle-Bois Duramhen971: BD971, is devoted to the study of environmental effects on timber structures in Guadeloupe island..

METHO-DOLOGY OF THE STUDY

e first step of the study is the acquisition of data, it is based on two sources: the set of measurement given by *Meteo France* stations (here Relative Humidity HR% perature θ of surrounding air) and measurements on sites of the same parameters and also wood moisture content. Some sites are chosen to be very close to tions in order to compare HR% and θ coming from *MF* measurements and BD971 records. Sites are recorded twice a month and one site is under hourly monitor s of data are linked by Equilibrium Moisture Content diagram EMC, with the limits of EC5 moisture content: 12 and 20% are the upper limit of service class 1 an ectively. 100 sites, ≈ 300 elements and ≈ 500 faces are measured during 12 to 18 months. MC measurements give an important data base for moisture con sent in tropical and soft woods used in FWI. HR% and θ give parameters to analyze the conventional EMC as used in European areas.

FIRST RESULTS AND ANALYSIS
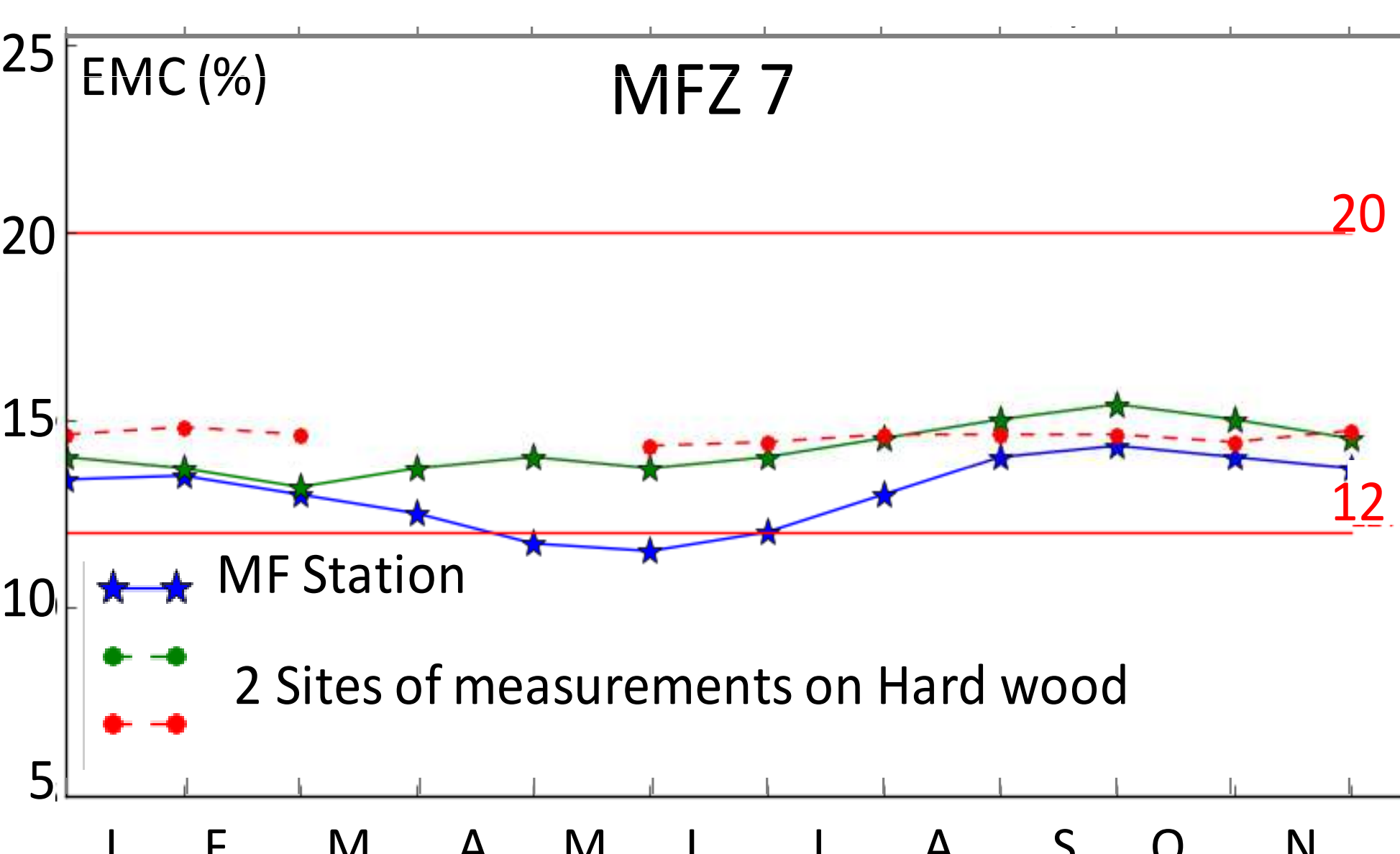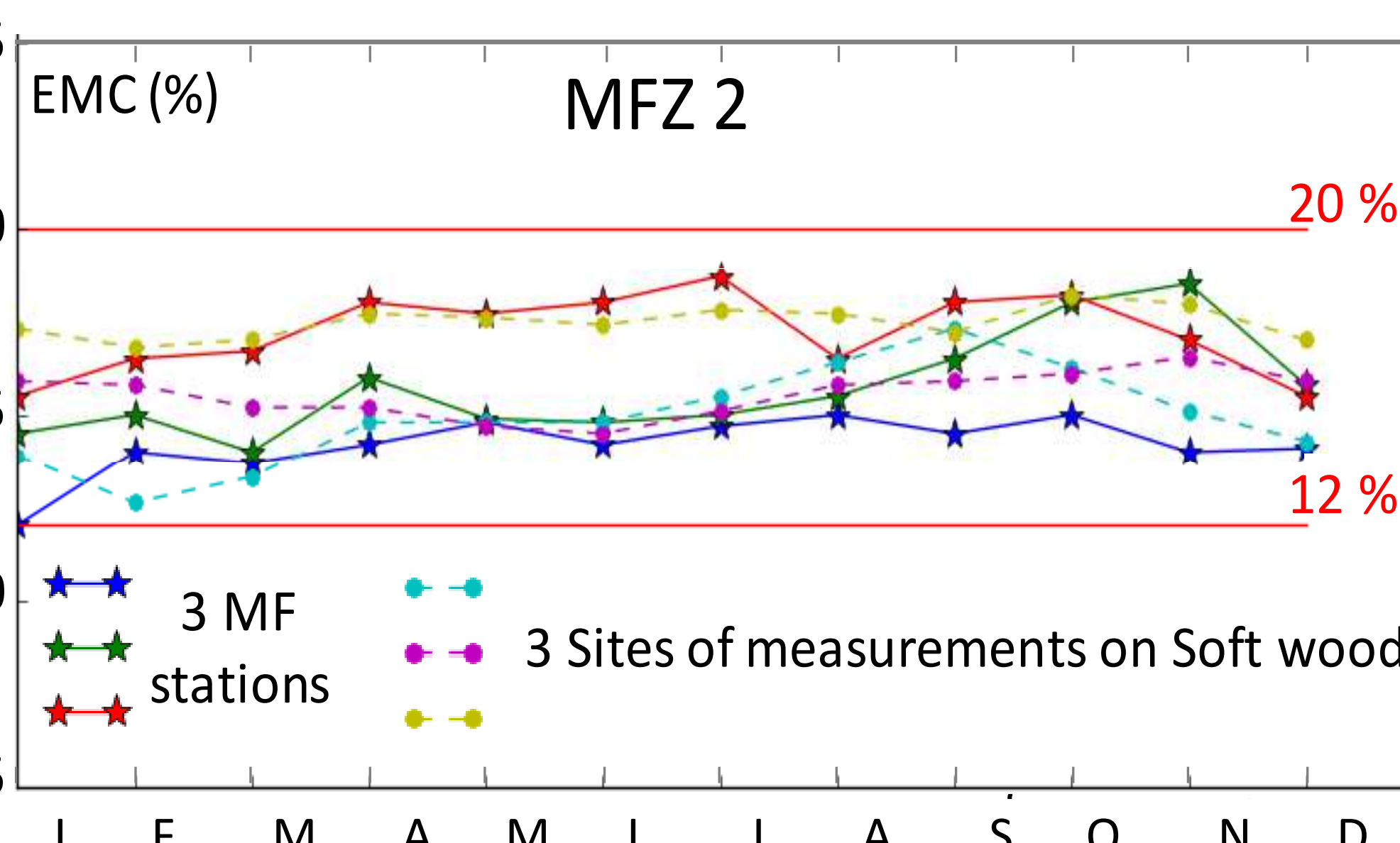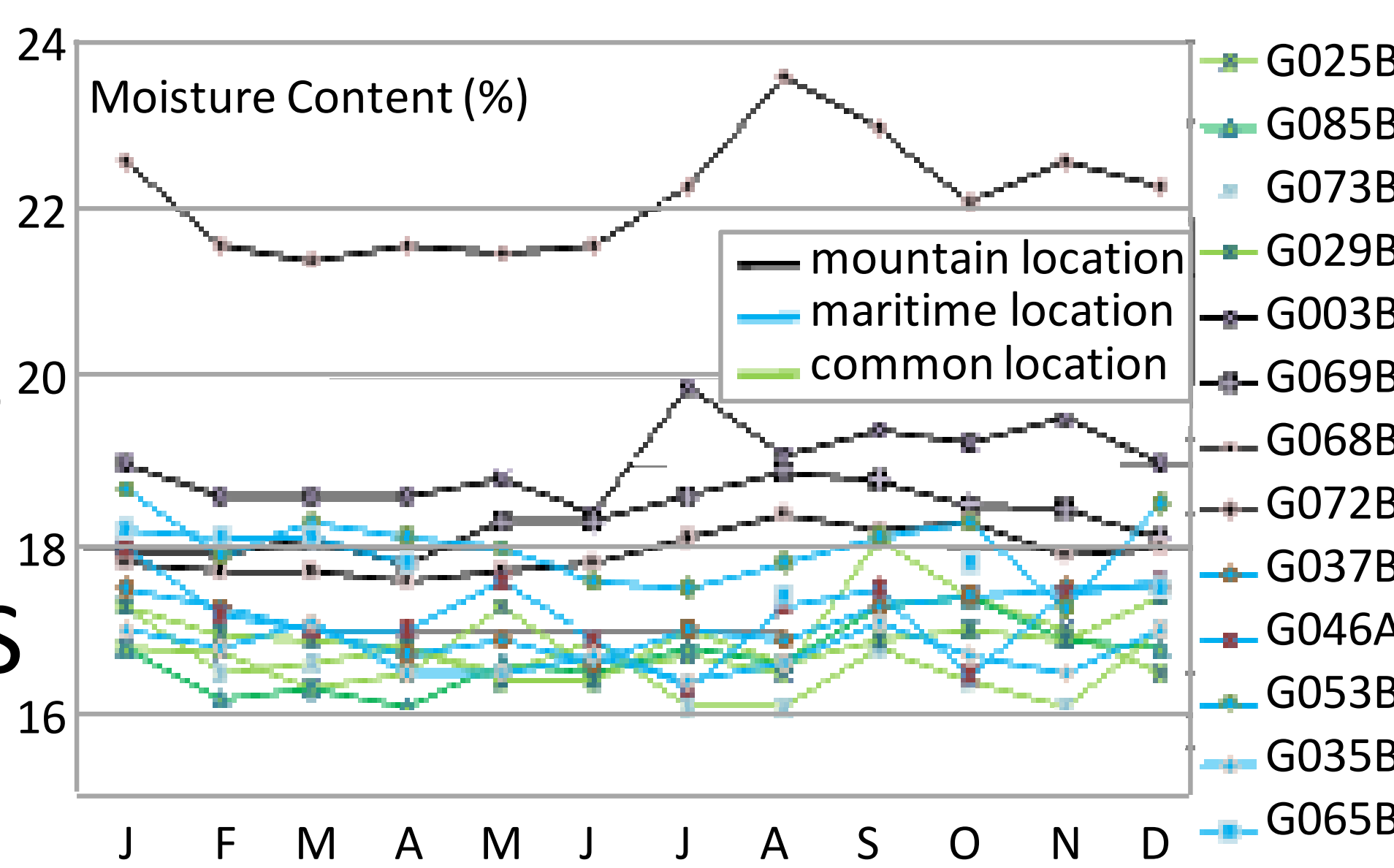
e comparison of the *Meteo France* measurements with those of BD971 shows a good consistency of the results (HR% and θ). BD971 results allow us to re rmation on the whole building area of Guadeloupe. MC measurements are also in a good accuracy with environmental test chamber results. First figure shows bility of MC measurements on same bus stops located all over the island. Most of them can be considered in service class 2. The two over figures present for eteo France zones the calculated EMC with HR% and θ with *MF* data and BD971 measurements for building realized with soft wood and tropical wood. Part of res ws homogeneous MF zones and wood EMC. But some other *MF* zones are not in accuracy with a common wood moisture content.

CONCLUSIONS
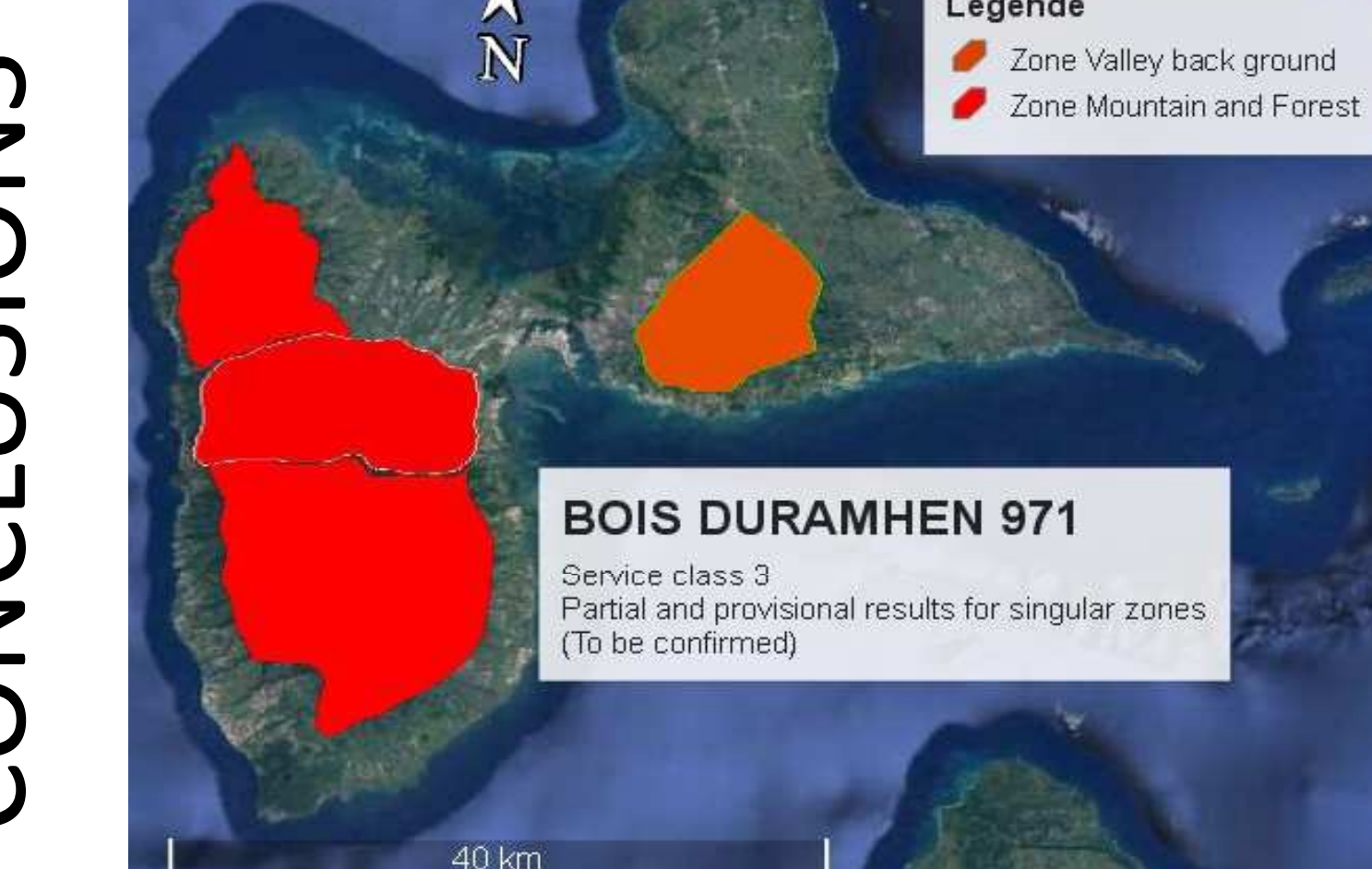
The results obtained by the different approaches, the comparison of measurements, the calibration of measurem equipment conducts to a wide data base and give interesting projections. On most of the *MF* stations and the different sit the calculated and measured moisture content values fit well inside a *MF* Zone. In this case, service class zone might clearly defined. In other zone(s), the service class determination have to be more detailed and deepened in order to propos more precise map. The variation of MC during the year should be determinant for that. The work presented here will continued until the end of 2018. Parameters such as Wind could be taken in account and its influence can be more or le important regarding softwood or hardwood. Equilibrium Moisture content diagram should be also modified for hardwood; actual tests on environmental chamber might produce this kind of information. This study will be also completed by a simi work for Martinique island.

Synergîle   l'Europe s'engage en Guadeloupe avec le FEDER   UNION EUROPÉENNE   PROJET COFINANCÉ par le fonds européen de développement régional   REGION GUADELOU

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