

SUMMARY

The computer programmes are tools for understanding the floods water flows of a stream which are very important to prevent catastrophes.

Those programmes are of special interest in Spain due our particular orography and the different rainfalls regime. That's mean a very rough territory relief together with intensives rainfalls during small time period. This study or thesis pretends to knowledge a programme performance through the Riera del Carmen.

The main objectives of this study are to know all parameters or variables values which we are used in our programme (Sobek) in order to obtain a realist modelling of the Riera del Carmen hydrograms and to study the programme sensibility in case that those parameters would be changed. Our purpose is to develop a model for the management all together the surface and groundwater hydrologic of this basin. All this study is focusing in the Riera del Carmen and the hydrograms, pluviograms data as well as depths above water level necessary to achieve this project have been supplied by the ACA.

The methodology followed was to establish the basin division into a several sub-basins and for each one to appoint the value of slope, depth, surface, the main river bed length, concentration time, etc.

To set up the performance of this programme applying its differents parameters and knowing the most sensitives parameters just to know where we need more precision. It has been made many tests and the conclusion was that the "reaction factor" was one of the most sensitives and difficult to be defined. This parameter changes depending of the slope, time and the area specially

In order to simplify the problems which represent the infiltration value in the ground we have applicated the Hans Paul black box model to knowledge the gross rainfall values and this allow us to know the net rainfall values. If we put in the Sobek programme the gross rainfall value of a sub-basin we can obtain a hydrogram but we can not develop a global aquifer to be surcharge from all the sub-basins. For this reason we had to work with the black box model, in this way we did not need also to know in detail about this complex aquifer of the Riera del Carmen. As we knew the net rainfall of whole basin we decided to separate the surface and the groundwater hydrological to provide the hydrogram calculus.

We had to suppose that all sub-basins were impermeable, as we knew the rainfall net value should be all a surface run-off, so we have to establish only the reliable reaches in groundwater flow of areas before known and the programme will give us the hydrogram with surface groundwater rearches.

By the time we got the hydrograms calculated with the Sobek and we compared those with the measured hydrograms supplied by the ACA.

It has been demonstrated by the result of above comparison that the groundwater flows foresee were lowers because the hydrogram measured shows an average flow higher to the hydrogram average calculated with the programme.

There are changes not only between the hydrograms measured and those calculated hydrograms due to a shortage of groundwater flows also we could verify differences between the hydrograms peaks calculated and measured during some rain event caused by a performance failure about the net rainfalls data.

This thesis shows that is important a good programme but it is more important to get a contour conditions (piezometric depths, flows) as well as reliable and verified rainfalls.