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GEOMORPHIC AND LANDFORM SURVEY OF NORTHERN APPENNINI

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The scope of this report is to illustrate the methodology we utilized in order to follow with time the runoff variations of the main rivers recorded on Landsat II images.
The work was divided in two major topics

a) Hydrographic network mapping
b) Runoff variation description

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a) Hydrographic network mapping

This work was done in first stages of our research in order to find out some characteristics of the surveyed territory.
The mapping was accomplished utilizing 1:250.000 prints of different band and Landsat II passes.
In detail MSS band 4,5 and 7 and false colour composition of these bands were studied regarding the Northern part of Appenninic Range facing Po river valley.
The three Landsat II passes are between June I4 and July 20 (year I975).
Image numbers are 2I79-09273; 2I43-09275; 2I97-0927I and 20I7--09274.
The significant results identified by this analysis are based on the principal hydrography characters of the main river of the area: Po river.
In fact affluents coming from North have an all year run off typical of Alpine rivers whilist the affluents moving in South to North direction (Appenninic) have a seasonal behaviour typical of creeks.
Utilizing Landsat II images we noted that for the purposes of hydrographic network mapping is not possible to employ a single band (7 for istance).

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In fact band 7 is not useful quite completely in mapping large creeks where the reflected energy is due mainly to the response of the bottom of these alluvial rivers areas. In fact in these rivers the water run off is not very poor only in spring-time or after rain storms.
We have noted that the maximum of the spectral response due to local geology of these alluvial areas lies between 0.5 and 0.6 micron and so pertains to wavelenght of MSS 4 band.
For the above mentioned reasons both 4 and 7 MSS band were employed in order to trace a detailed hydrographic network map.
This map and the comparison of the difference in lenght of seasonal hydrographic map will be presented and discussed in detail in the final report.

b) Run off variation

In order to have reliable data on the possibility to follow with time the Po river run off we compared the streamflow width variation as seen from Landsat II images with river hydrometric variations in some fixed places.
Basing on the data recorded in the same days of Landsat II passes it was possible to build up a diagram of hydrometric height variations in Piacenza and Boretto (two towns placed on the river shores: the first far and the second close to the mouth) Fig. A and B.
A second diagram was draft from a detailed study of the water covered section in the same areas of the hydrometric stations (fig. C and D).

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From the comparison of the two kind of diagrams is easy to relate the run off variation with river width variation in these selected areas.
More data are on study for a better detail of the obtained results which will be presented in final report.
It is important to note that these data demonstrate that it is possible to utilize this approach for the management of total run off in this basin.
A suitable model is on study and we hope to have it in a operational stage on a test area before the end of the year.

Ad. Marino

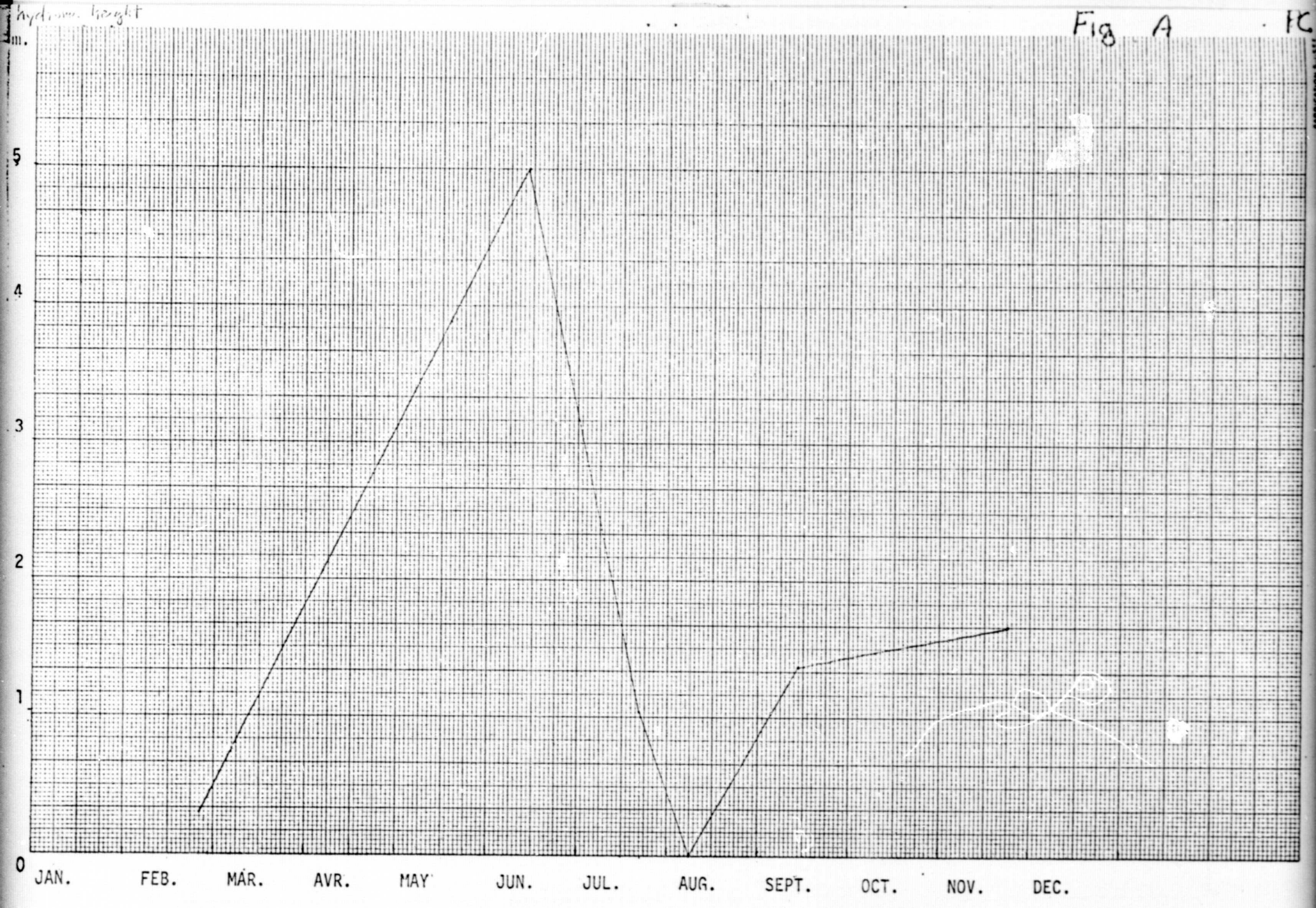


Fig A

hydrometric height at Piacenza (6 Landrat II Passes)

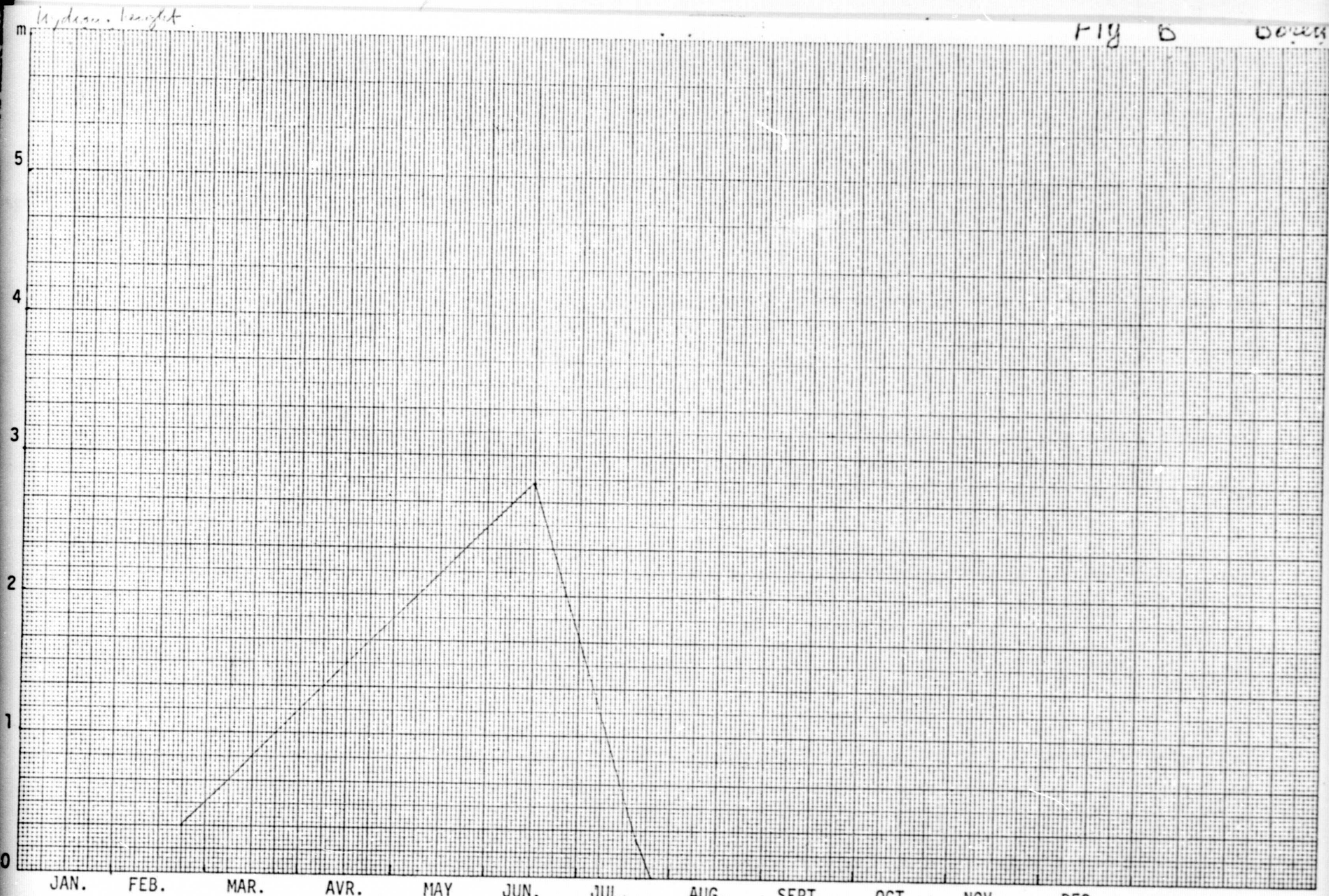
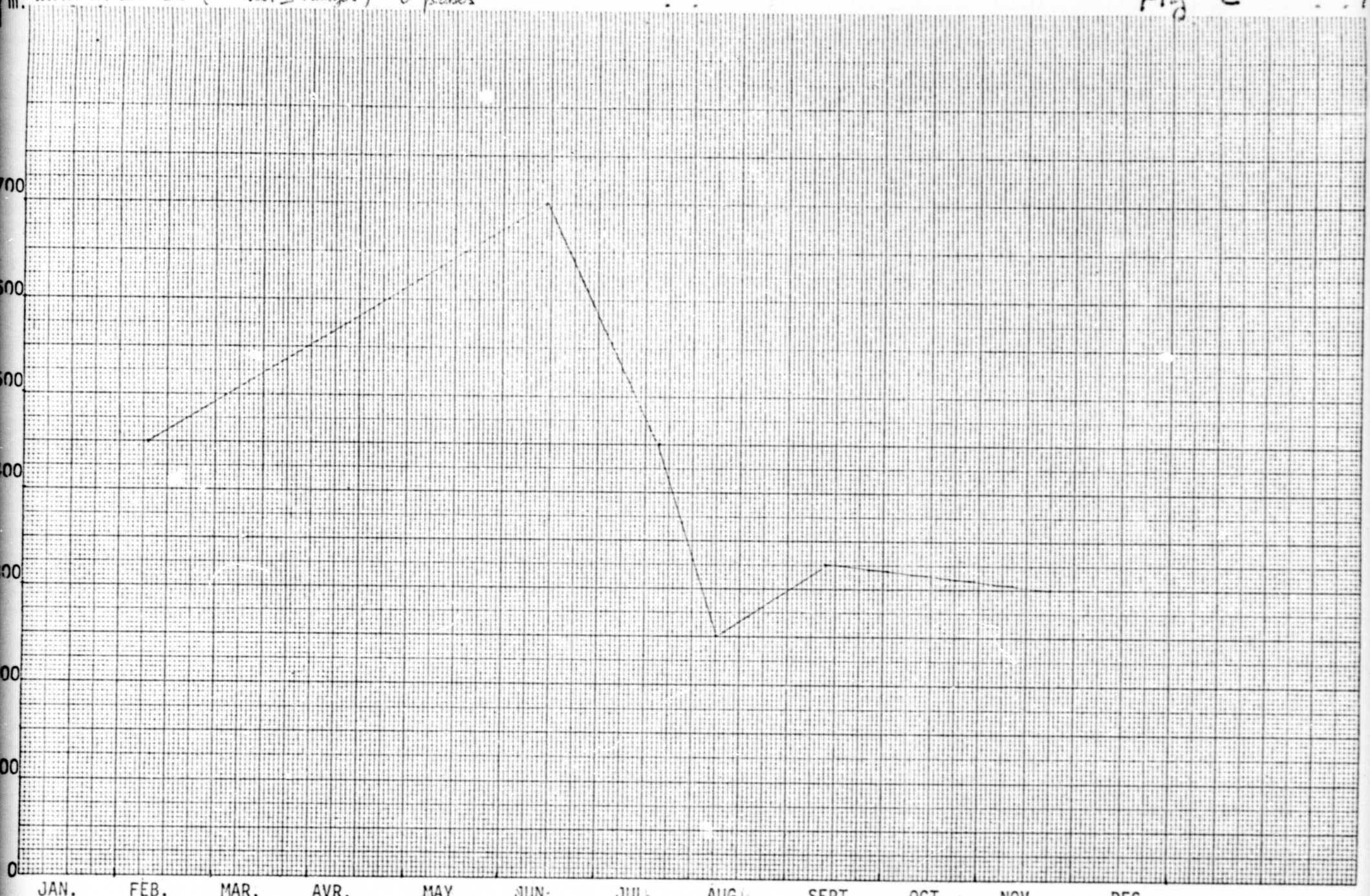


Fig 6 Bretto

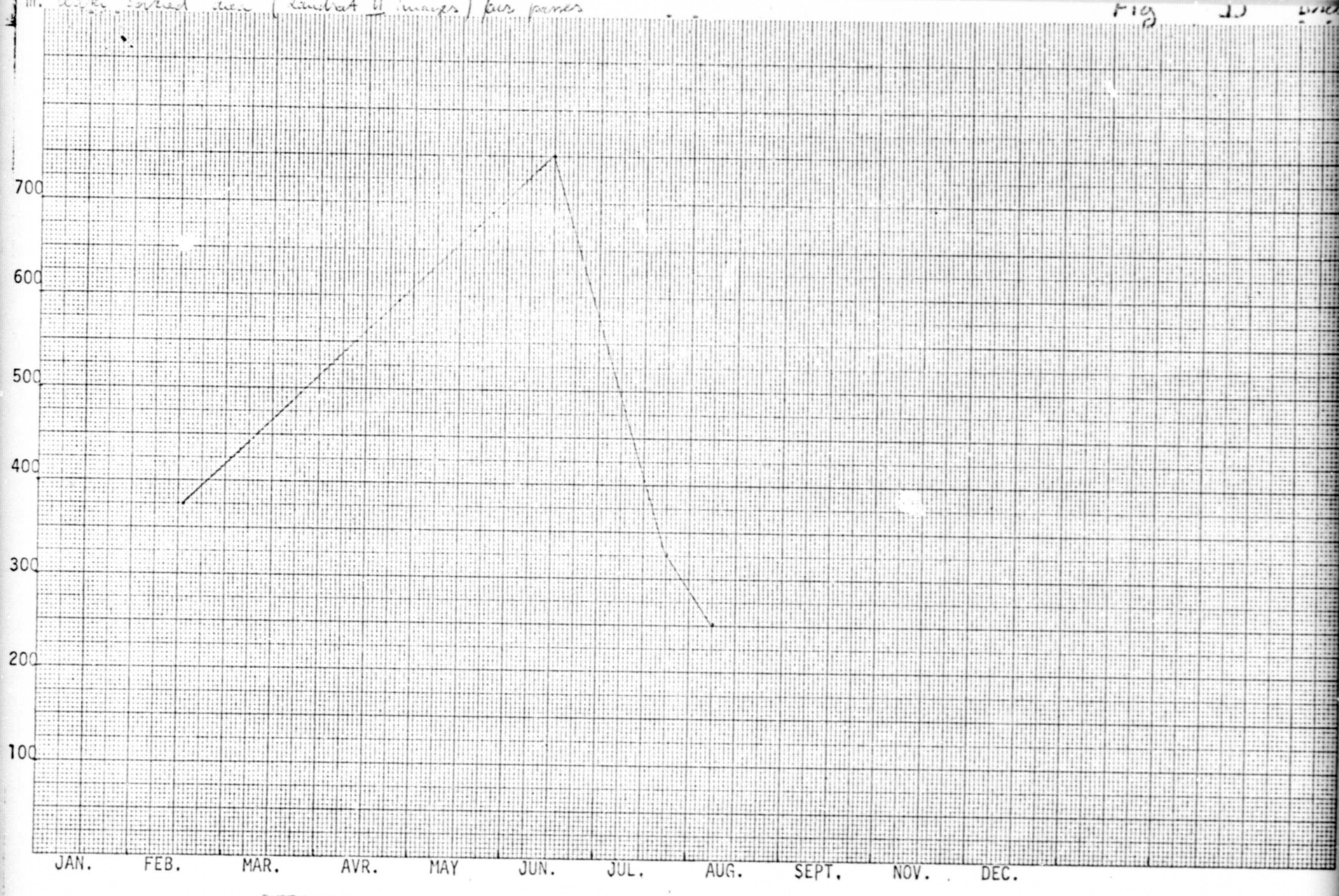
hydrometric height at Bretto (4 Landsat II passes)



Piacenza : water covered area as seen from Landsat II image

m. water covered area (Landsat II images) four passes

Fig 13



Boretto : water covered area as seen from Landsat II