

The flood meteorological risk warning system based on GIS and its application

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Objectives

Realize the Minjiang River basin Nanping section of main tributary rainstorm flood real-time monitoring and disaster storm caused flood meteorological risk forecast early warning and product production.

Methods

Based on GIS of minjiang river basin Nanping section of flood meteorological risk early warning system using geographic information data, hydrological data, live and intelligent rainfall grid precipitation forecast products, the live and forecast calculation of river basin rainfall, build flood monitoring model, using D model basin real-time and estimated flood forecast.

Results

On June 17~18, 2022, Nanping, a persistent rainstorm process, the system warning 34 hours in advance built stream basin flood meteorological risk warning level 2, flood meteorological risk possibility, forecast water level and actual water level, accurate forecast, because early warning and personnel transfer timely, no personnel death, for leading disaster prevention and mitigation has a good scientific basis.

	Chongyang River Basin	Futun Riverbasin	Jianxi River Basin	Nanpu River Basin	Minjiang River basin Nanping section	total
the forecast quantity	13	26	26	29	12	106
the correct forecast quantity of non-graded inspection	11	26	20	23	12	92
the empty forecast quantity of non-graded inspection	2	0	6	6	0	14
the omissions forecast quantity of non-graded inspection	0	0	0	0	0	0
the non-graded empty rate%	15.4	0.0	23.1	20.7	0.0	13.2
the non-graded omission rate%	0.0	0.0	0.0	0.0	0.0	0.0
the non-graded TS score	84.6	100.0	76.9	79.3	100.0	86.8

Table 1 Ungraded inspection form for the products of minjiang river basin nanping section of flood meteorological risk early warning system

Conclusions

From the inspection of flood meteorological risk forecast and early warning products, the forecast accuracy of non-graded inspection is 86.8%, the empty rate is 13.2%, and the omission rate is 0%; the forecast accuracy of graded inspection is 81.4%, the vacancy rate is 18.6%, and the omission rate is 0%; From the perspective of warning time advance, the minimum average warning advance is 12 hours, the maximum average warning advance is 56 hours, and the total average warning advance is 36 hours. It can be seen that the flood meteorological risk early warning product has high accuracy and long early warning advance, which effectively improves the flood meteorological risk early warning ability caused by disaster and rainstorm in Nanping section of Minjiang River Basin.

	Chongyang River Basin	Futun Riverbasin	Jianxi River Basin	Nanpu River Basin	Minjiang River basin Nanping section	Total Average (hour)
Minimum lead time (hour)	14	12	14	17	3	12
Maximum lead time (hour)	59	68	61	59	33	56
Average lead time (hour)	39.7	41.2	43.2	37.8	18	36

Table 2 Inspection Table for Early Warning Advance of Flood and Waterlogging Meteorological Risk Warning Products in the Nanping Section of the Minjiang River Basin