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基于物元模型的避暑休闲 地产气候资源评价研究^①

宋丹妮, 匡鸿海

, 400715

摘要: 适宜的气候资源是避暑房地产开发的首要前提, 以重庆市城口县双河乡余坪村为例, 利用物元模型, 对夏季平均气温、夏季相对湿度、夏季平均风速、夏季月均日照时数、夏季月均降水量和平均海拔 6 个影响避暑气候的因素进行综合评价, 并构建避暑休闲地产气候资源物元分析评价模型, 研究表明, 余坪村避暑休闲地产气候资源评价等级为适宜, 适宜作为避暑休闲地产开发。

关键词: 避暑气候资源; 评价等级; 物元模型; 综合评价; 双河乡余坪村

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[1],

避暑气候资源评价研究, 1920; Thom^[3] 1959; Oliver^[5] 1973; Terjung^[4]; [6]; [7]; [8]; [9]; [10] GIS 22

1 研究区域概况

研究区域位于 108°20'30"E—108°24'00"E、31°52'00"N—31°55'30"N, 面积 12.51 km²,

① : 2015-01-03
: “ ” (2012BAJ23B00); 2014-2020 ; 2015-2020
: (1990-), , , , RS, GIS .

941 m³,
 2012 ,
 1 229.80 hm²; , 16.97 hm²;
 4.01 hm²(1).

表 1 余坪村土地利用现状情况表

	/hm ²	
	241.65	0.193 2
	31.66	0.025 3
	944.49	0.755 1
	12.00	0.009 6
	1 229.80	0.983 2
	16.97	0.013 6
	16.97	0.013 6
	3.32	0.002 7
	0.69	0.000 6
	4.01	0.003 2
	1 250.78	1.000 0

2 物元评价模型

20 80 , [11] . [12] , [13] .

2.1 物元的定义

M , c v , $R=(M, c, v)$
 M n c_1, c_2, \dots, c_n v_1, v_2, \dots, v_n :

$$R(M, c, v) = \begin{bmatrix} M & c_1 & v_1 \\ & c_2 & v_2 \\ & \vdots & \vdots \\ & c_n & v_n \end{bmatrix} \quad (1)$$

2.2 确定经典域和节域

$$R_{0j} = R(p_{0j}, c_i, v_{0ji}) = \begin{bmatrix} p_{0j} & c_1 & X_{01j} \\ & c_2 & X_{02j} \\ & \vdots & \vdots \\ & c_n & X_{0nj} \end{bmatrix} = \begin{bmatrix} p_{0j} & c_1 & (a_{01j}, b_{01j}) \\ & c_2 & (a_{02j}, b_{02j}) \\ & \vdots & \vdots \\ & c_n & (a_{0nj}, b_{0nj}) \end{bmatrix} \quad (2)$$

p_{0j} j ($j = 1, 2, \dots, m$); c_i p_{0j} i ; $X_{01j}, X_{02j}, \dots, X_{0nj}$, X_{0ij} , (a_{0ij}, b_{0ij}) .

$$P \quad R_p \quad ,$$

$$R_p = (p, c, X_p) = \begin{bmatrix} P_{0j} & c_1 & X_{p1} \\ & c_2 & X_{p2} \\ & \vdots & \vdots \\ & c_n & X_{pn} \end{bmatrix} = \begin{bmatrix} p_{0j} & c_1 & (a_{p1}, b_{p1}) \\ & c_2 & (a_{p2}, b_{p2}) \\ & \vdots & \vdots \\ & c_n & (a_{pn}, b_{pn}) \end{bmatrix} \quad (3)$$

: $X_{pi} = (a_{pi}, b_{pi}), i = (1, 2, \dots, n), X_{0ij} = X_{pi}$.

2.3 距的计算

$$X_{0ij} = [a_{0ij}, b_{0ij}]$$

$$\rho(V_i, X_{0ij}) = \left| V_i - \frac{1}{2}(a_{0ij} + b_{0ij}) \right| - \frac{1}{2}(b_{0ij} - a_{0ij}) \quad (4)$$

$$\rho(V_i, X_{pi}) = \left| V_i - \frac{1}{2}(a_{pi} + b_{pi}) \right| - \frac{1}{2}(b_{pi} - a_{pi}) \quad i = 1, 2, 3, \dots, n; j = 1, 2, 3, \dots, m \quad (5)$$

$$(4) \quad \rho(V_i, X_{0ij}) \quad V_i \quad X_{0ij} = [a_{0ij}, b_{0ij}] \quad ; \quad (5) \quad \rho(V_i, X_{pi}) \quad V_i \quad X_{pi} = [a_{pi}, b_{pi}]$$

2.4 关联函数值

$$K_j(V_i) = \begin{cases} \frac{-\rho(V_i, X_{0ij})}{|X_{0ij}|} & V_i \in X_{0ij} \\ \frac{\rho(V_i, X_{0ij})}{\rho(V_i, X_{pi}) - \rho(V_i, X_{0ij})} & V_i \notin X_{0ij} \end{cases} \quad (6)$$

: V_i, X_{0ij}, X_{pi}

2.5 权系数

$$N_i (i = 1, 2, \dots, m) \quad X_{ji} (j = 1, 2, \dots, n),$$

$$a_{ij} = \frac{x_{ij}}{\sum_{i=1}^n x_{ij}} \quad i = 1, 2, 3, \dots, n; j = 1, 2, 3, \dots, m \quad (7)$$

(7) , a_{ij} j i ; x_{ij} j i .

2.6 综合关联度

$$K_j(p) = \sum a_{ij} K_j(V_i) \quad i = 1, 2, 3, \dots, n; j = 1, 2, 3, \dots, m \quad (8)$$

: $K_j(p)$ p j . $K_j = \max\{K_j(p)\}, j \in \{1, 2, \dots, m\}$, p j .

3 余坪村避暑休闲地产气候资源评价模型构建

3.1 评价因子及分级

“ ”

(c_1)、(c_2)、(c_3)、(c_4)、(c_5)、(c_6)

、《 》(2007)； 90 m×90 m DEM DEM

(2).

表 2 避暑休闲地产气候资源评价等级标准

(c_1)/°C	(c_2)/m	(c_3)/%	(c_4)/(m·s ⁻¹)	(c_5)/h	(c_6)/mm
24	1 500	77.5	0.95	185	190
22	1 200	74.5	0.85	165	165
20	800	72.5	0.75	150	140

3.2 数据预处理

$$d_i = \frac{x_i}{x_{\max}}$$

3.

表 3 归一化后避暑休闲地产气候资源评价等级标准

c_1	c_2	c_3	c_4	c_5	c_6
1.00	1.00	1.00	1.00	1.00	1.00
0.92	0.80	0.96	0.89	0.89	0.87
0.83	0.53	0.94	0.79	0.81	0.74

3.3 建立评价物元矩阵

《 》(2007)，

1 230 m, 22.50 °C, 76.9%, 0.67 m/s,

162 h, 186.2 mm. (1) 3

$$R_1 = \begin{bmatrix} p_1 & c_1 & (0, 0.83) \\ & c_2 & (0, 0.53) \\ & c_3 & (0, 0.94) \\ & c_4 & (0, 0.79) \\ & c_5 & (0, 0.81) \\ & c_6 & (0, 0.74) \end{bmatrix}$$

$$R_2 = \begin{bmatrix} p_2 & c_1 & (0.83, 0.92) \\ & c_2 & (0.53, 0.80) \\ & c_3 & (0.94, 0.96) \\ & c_4 & (0.79, 0.89) \\ & c_5 & (0.81, 0.89) \\ & c_6 & (0.74, 0.87) \end{bmatrix}$$

$$R_3 = \begin{bmatrix} p_3 & c_1 & (0.92, 1.00) \\ & c_2 & (0.80, 1.00) \\ & c_3 & (0.96, 1.00) \\ & c_4 & (0.89, 1.00) \\ & c_5 & (0.89, 1.00) \\ & c_6 & (0.87, 1.00) \end{bmatrix}$$

$$R_p = \begin{bmatrix} R_p & & & & & & \\ c_1 & c_2 & c_3 & c_4 & c_5 & c_6 & \\ (0, 1.00) & (0, 1.00) & (0, 1.00) & (0, 1.00) & (0, 1.00) & (0, 1.00) & (0, 1.00) \end{bmatrix}$$

$$R_p = \begin{bmatrix} R_p & & & & & & \\ c_1 & c_2 & c_3 & c_4 & c_5 & c_6 & \\ 22.5 & 1230 & 76.9 & 0.67 & 162 & 186.2 & \end{bmatrix}$$

$$R_p = \begin{bmatrix} R_p & & & & & & \\ c_1 & c_2 & c_3 & c_4 & c_5 & c_6 & \\ 0.94 & 0.82 & 0.99 & 0.71 & 0.88 & 0.98 & \end{bmatrix}$$

3.4 权系数计算

(7)

4.

表 4 避暑休闲地产气候资源评价权系数

	c_1	c_2	c_3	c_4	c_5	c_6
	0.17	0.17	0.17	0.17	0.17	0.17
	0.17	0.15	0.18	0.17	0.17	0.16
	0.18	0.11	0.20	0.17	0.17	0.16

3.5 各个评价指标关联度及综合关联度

(4), (5), (6), (8)

5.

表 5 评价指标关联度

$K_j(V_1)$	$K_j(V_2)$	$K_j(V_3)$	$K_j(V_4)$	$K_j(V_5)$	$K_j(V_6)$	$K_j(p)$
0.250	0.100	0.250	-0.383	-0.091	0.154	0.047
-0.250	-0.100	-0.750	-0.216	0.091	-0.846	-0.352
-0.647	-0.617	-0.833	0.101	-0.368	-0.923	-0.549

4 结论与讨论

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A Research of Evaluation of Summer Leisure Real Estate of Climate Resources Based on the Matter-Element Model

SONG Dan-ni, KUANG Hong-hai

School of Geographical Sciences, Southwest University, Chongqing 400715, China

Abstract: Choosing climatic resources appropriate for summer leisure real estate development has become an important prerequisite for the development of real estate. In order to provide a theoretical basis for the future development of summer leisure real estate in Chengkou county of Chongqing city, a study was made with Yuping village, Shuanghe township as an example, in which summer average temperature, relative humidity in summer, summer average wind speed, monthly average sunshine time of summer, monthly average precipitation of summer and average elevation of the village were comprehensively evaluated based on the matter-element model, so as to build a summer leisure real estate of climate resources matter-element evaluation model for summer leisure real estate projects of the county. The results showed that the assessment grade of summer leisure real estate climate resources of Yuping village was “suitable”.

Key words: summer comfortable climate resources; evaluation grade; matter-element model; comprehensive evaluation; Yuping village of Shuanghe township

