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Technical Report No. 1

Environment Pattern Reconstruction from Sample Data. I. Mississippi Delta Region

by

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ABSTRACT

A ten percent random sample of map data is judged adequate to reproduce the first order spatial characteristics of the distribution pattern for the seven major types of depositional environments in the Mississippi Delta region of Southeast Louisiana. This conclusion is based on: 1)dendrographs which portray interdistance relationships among mean coordinate locations for the different environments, 2)the sampling properties of the Goodman-Kruskal measure of cross association as it is applied to nearest unlike neighbor samples, and 3)proximal maps which are reconstructions of the original pattern based on sample data.

In analyzing map patterns, principal component analysis can be used to depict spatial trends. Within the Mississippi Delta region, the natural levee, point bar, bay-sound, and beach environments show a marked linear trend whereas the swamp, lacustrine, and marsh environments are more isotropic. With respect to location, the lacustrine environment is situated in an intermediate position between nonmarine and marine depositional environments.

The total sample of 4025 data points taken from the environment distribution map of the Mississippi Delta region on which this study is based is contained in the Appendix.

CONTENTS

Introduction

The detection of spatial order within a depositional environmental framework is dependent upon the elusive relationship that exists between the spatial arrangement and size of the areal units of observation and the degree of complexity of the underlying pattern. Traditionally, the interpretation of environmental map patterns has been accomplished by subjective analysis. Progress toward a more quantitative approach has been handicapped by the lack of suitable statistical measures for describing the spatial character of depositional environmental patterns by which different patterns can be compared and those obscured because of limited areal sampling detected. The primary objective of the present research is to develop a statistical methodology for analyzing environmental map patterns from the point of view that, ultimately, it should be possible to set minimum sampling requirements in advance of regional environmental studies in offshore areas where only limited sampling is economically justified.

Within the past decade, a considerable literature has emerged in the field of human geography, epidemiology, and quantitative plant ecology which relate to spatial analysis ([1],[2]). An excellent review article has appeared recently relating the analysis of spatial form to geographic theory [3]. For the most part, the studies have concentrated on areally distributed point processes where data are generated within artificially defined boundaries. For environments, the boundaries bear no direct relationship to geographic coordinates and the type of patterns found are best described as multiphase mosaics. The closest approach to the quantitative study of environment distribution patterns has been in the field of ecology [4]. There needs to be developed in geology statistical measures which will describe the spatial structure of environment distribution patterns. The statistical properties of such measures based on different size samples under different sampling plans could then be established. This report describes the results of a preliminary study directed toward this end.

percentage. The percentages reflect the relative areas covered by each of the different environments. Such information is of value in comparing environment areal coverage with other deltaic complexes. If we define the Total Information (T.I.) obtained from sampling as

$$T.I. = \sum_{j=1}^{7} j\, n_j$$

where n_j is the number of areal units of observation which contained j different environments, it is found that T.I.=6296. The portion of the total information used in this study comprised only the environment data gathered from the randomly located points within the areal observation units. This Relative Information (R.I.) defined as

$$R.I. = T.I. / \sum_{j=1}^{7} n_j$$

is equal to .62 or 62 percent. While this may seem like an undue degradation of the original information, over one half of the areal units of observation contained only a single environment while ninety-two percent contained no more than two. For now at least, the areal coverage as represented by the sample is considered adequate. It may be necessary later to make more complete use of the original information.

Spatial Form

Beyond the direct observation of environment distribution maps and subsequent subjective evaluations, it is useful to have graphical aids for characterizing pattern structure. Two new forms of graphic display have been developed: 1)spatial principal components, and 2)environment centroid interdistance dendrographs. Each can be illustrated using the environmental data gathered in this study.

Spatial principal component analysis provides a rapid and effective means of portraying the spatial

one grid unit equals approximately 1.5 miles. Only one half of the matrix is filled due to the symmetry. Based on an unweighted pair group clustering of the coefficients, the dendrograph shown in Figure 4 is produced. The dendrograph depicts the marine versus nonmarine associations of the seven major environments. Further, it reveals the transitional character of the lacustrine environment. With a smaller sample, a similar pattern should result within statistical limits. Here again, statistical tests need to be developed. To see what does happen with a smaller sample, a random sample of 500 from the total of 4025 areal units of observation was chosen. The dendrograph that resulted is shown in Figure 5. While some rearrangement of the environments takes place, the basic pattern remains the same. As a first approximation, it is reasonable to conclude that the pattern generated from a sample of 500 points preserves the spatial order contained within the original data.

Proximal Maps

It is not enough to reproduce the spatial order within environment map patterns based on summary statistics calculated from sample data but in addition, it is further desirable to reconstruct the underlying pattern. The problem of reconstructing patterns from sample data has been considered in the context of locating sample points in a way which minimizes the loss due to misclassification in the pattern reconstruction based on nearest neighbor relations [8]. For m-color patterns having a definite cell structure, it is possible to obtain an optimal sample spacing. For more complex patterns, however, such as are found in natural environments, the determination of an optimal spacing in closed form is rendered virtually intractable.

In an attempt to determine the effectiveness of pattern reconstruction of the Mississippi Delta complex based on sample data, a series of sampling experiments were performed in which random samples and subsequently systematic samples were drown from the total population and the derived data used to generate proximal maps using the SYMAP computer program [9]. The different sample sizes drawn were 5,

Study Area and Population Sample

For this pilot study, it was decided to choose an area which had been mapped in considerable detail and which contained diverse environment elements arranged in a complex pattern. Further, it was desired that such an area would be representative of a major depositional environment framework found both in the Recent and in the geologic past. The area which best suited these requirements was the Mississippi Delta Region of Southeastern Louisiana. The Mississippi Delta complex is probably the best known of the world's delta systems. This area has been studied and extensively mapped over a period of several decades. The recent deposits, their depositional environments and areal distribution have been well documented ([5],[6]). The depositional environments of the Mississippi Delta complex excluding the offshore can be broadly subdivided into seven major types. These are the 1)natural levee, 2)point bar, 3)swamp, 4)marsh, 5)beach, 6)lacustrine, and 7)bay-sound. The areal distribution of these seven major environments is shown in Figure 1. This map constitutes the source of data for the present study.

The initial step was to convert the pattern represented in Figure 1 into digital form by superposing a fine mesh grid over the map and record the environments present within each areal unit of observation. For practical purposes, it was desired to obtain a point representation of the environment distribution pattern and so the type of environment chosen as representative of each areal unit was determined as that one which was situated at a randomly located point within. The grid overlay used to sample the deltaic complex pattern is shown in Figure 2. The finer grid containing one hundred areal units of observation each with a point located at random within was moved over the coarser grid which encompassed the map area to be sampled. The data obtained in this manner are listed in the Appendix. A total of 4025 areal units of observation were recorded. The aggregrate composition of the environments contained within these areal units is given in Table 1. The eighth column in Table 1 lists the total number of each type of environment recorded at the points located at random within the areal units of observation and the last column gives the

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Spatial principal component analysis provides a rapid and effective means of portraying the spatial

trend for a particular environment. Let $V = \{(x_1,y_1), (x_2,y_2),\ldots,(x_n,y_n);(x_k,y_k)\epsilon E_j\}$ be defined as the set of paired x-y coordinates of the data representing the areal distribution of the jth environment, E_j. The principal components of which there are two are defined by

$$CP = \Lambda P$$

where C is the covariance matrix of the x-y coordinates of V, P is a 2x2 orthogonal matrix whose column vectors are the linear coefficients of the first and second principal components, respectively, and Λ is a 2x2 diagonal matrix whose diagonal elements represent the variance of each of the respective principal components. In the present context, these can be referred to as the spatial components. The spatial components for the seven major environments of the Mississippi Delta are shown in Figure 3. The axes for each of the environments is centered about the mean x-y position for each set of coordinates and the length of each axis is taken as twice the standard deviation. The orientation of the axes is determined by the linear coefficients of the component vectors. The spatial trends are readily observable. The elongate shapes of the natural levee, point bar, and the beach environments can be seen along with the more isotropic patterns of the swamp, marsh, and lacustrine environments. Rather surprising is the sharpness of the trend for the bay sound environment. Considering the depositional aspect, the first principal component whose axis is longest, gives the depositional strike of the sediments. It is indicative of the direction of sediment transport for fluviatile and current related deposits. For a more limited sampling of the area than was undertaken in the present study, from such sampling if it is to be considered adequate, it should be possible to reproduce the spatial trends indicated in Figure 3. Statistical tests of significance should be developed.

A lower order measure of spatial structure are dendrographs which portray the interdistance relationships between the coordinate mean positions of the different environments. For the Mississippi Delta data, the matrix of pairwise mean coordinate positions for the seven major environments is given in Table 2. The interdistances are expressed in grid units where

one grid unit equals approximately 1.5 miles. Only one half of the matrix is filled due to the symmetry. Based on an unweighted pair group clustering of the coefficients, the dendrograph shown in Figure 4 is produced. The dendrograph depicts the marine versus nonmarine associations of the seven major environments. Further, it reveals the transitional character of the lacustrine environment. With a smaller sample, a similar pattern should result within statistical limits. Here again, statistical tests need to be developed. To see what does happen with a smaller sample, a random sample of 500 from the total of 4925 areal units of observation was chosen. The dendrograph that resulted is shown in Figure 5. While some rearrangement of the environments takes place, the basic pattern remains the same. As a first approximation, it is reasonable to conclude that the pattern generated from a sample of 500 points preserves the spatial order contained within the original data.

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In an attempt to determine the effectiveness of pattern reconstruction of the Mississippi Delta complex based on sample data, a series of sampling experiments were performed in which random samples and subsequently systematic samples were drawn from the total population and the derived data used to generate proximal maps using the SYMAP computer program [9]. The different sample sizes drawn were 5,

10,20,50,100,200, and 500, respectively. A proximal map is generated by assigning to each location on a fixed grid the type environment found for the nearest sample. Thus, proximal maps follow a nearest neighbor rule in their construction. Figures 6 and 7 contain proximal maps of the Mississippi Delta reconstruction for the different sample sizes noted above obtained for random samples and for systematic samples, respectively. In viewing the sequence of maps, the continuity of the natural levee environment does not become apparent until the sample size has reach 500. Furthermore, given the choice between random samples and systematic samples the latter are preferable since greater detail in the pattern structure results. Proximal maps produced in this way reveal the evolving pattern structure. The important question is how to decide when sufficient samples have been collected. It is anticipated some kind of multi-stage sampling procedure will be found to be optimal.

Pattern Cross Association

In addition to graphic forms which characterize the spatial order within environment distribution patterns and pattern reconstructions based on sample data, there needs to be devised statistical measures of map pattern structure. Such measures would be of value in assessing the relative strength of a given pattern and for comparing one pattern with another. More important, they could provide a means for determining the minimum sample size necessary to achieve a prespecified level of confidence in establishing a particular type pattern. The interpretation that is given to point patterns derives largely from nearest neighbor relations. In the Mississippi Delta data, the areal distribution pattern is defined by the type of environment occurring at the various grid locations. It is worthwhile to consider the degree of cross association that exists between the type of environment and the nearest sample. Since, for different environments, different areal coverages are involved, it is advantageous to consider the cross association that exists between samples and the nearest sample at which a different type environment is observed. This is referred to as the nearest unlike neighbor. For the Mississippi Delta data, the matrix of

nearest unlike neighbors is given in Table 3. The last row and column give the row and column sums, respectively. As a measure of cross association, the Goodman-Kruskal measure, λ_b, has been used [10]. This statistic measures the relative decrease in probability of error in trying to predict the nearest unlike neighbor of a sample point. For a given set of observations, λ_b is defined as

$$\lambda_b = \frac{\sum_{a=1}^{m} \nu_{am} - \nu_{.m}}{\nu - \nu_{.m}}$$

where ν_{am} is the largest entry in the ath row, $\nu_{.m}$ is the largest entry for the column sums and ν is the sample size. For the matrix in Table 3, λ_b = .356. This is interpreted as the measure of pattern strength for the areal distribution pattern represented in Figure 1.

It is of interest to consider the sampling properties of λ_b for different size samples. This kind of information is a prelude for determining a minimum sample size. As an initial experiment, random samples of size 10,20,50, and 100 were drawn from the total of 4025. For each sample size, the sampling was repeated 10,20,50,100,200,500, and 1000 times. For each set of repeated sampling for fixed sample size, the average value of λ_b was calculated. The results are shown in Figure 8. The damped oscillatory behavior of the observed values with increasing sample size is readily apparent. From these curves, it was possible to establish a product sampling rule of the form

$$S = kn$$

where S represents the total sample, k is the number of repeated sampling for a sample size n. For S = 1000, the following values of k and n were selected: 100,10 (k,n);50,20;20,50;10,100;5,200;1, 1000. The results of random sampling according to this rule in which the average values of λ_b were calculated are shown in Figure 9. From this, it is inferred that a size somewhere in the range from 200 to 500 random samples would be adequate for reproducing the nearest unlike neighbor relations

that exist for the population.

Summary

The primary aim of this preliminary investigation has been to develop graphical aids for describing the spatial form of environment distribution patterns. Spatial principal components and dendrographs depicting interdistance environmental relations both have proven effective. Pattern reconstruction from sample data has been accomplished by proximal mapping. The most important consideration, however, is the problem of minimum sample size required to reproduce a given pattern structure. For the Mississippi Delta complex considered in this study, a threefold argument based on environmental mean coordinate interdistance dendrographs, proximal maps, and cross association measures of nearest unlike neighbors leads to the conclusion that a ten percent random sample of the total area in the delta is sufficient to reproduce the underlying pattern structure. Systematic sampling leads to a more accurate representation while multistage sampling is expected to yield optimal results.

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Table 1

Population characteristics of environmental sample from Mississippi Delta region

Type environment	Number of different environments contained within each areal unit of observation classified according to the environments which were situated at the randomly chosen points in the grid								
	1	2	3	4	5	6	7	Σ	%
natural levee	182	317	49	5	0	0	0	553	14
point bar	6	36	4	0	0	0	0	46	1
swamp	303	264	69	1	0	0	0	637	16
marsh	687	539	110	3	0	0	0	1339	34
beach	0	9	8	0	0	0	0	17	<1
lacustrine	291	174	17	0	0	0	0	482	11
bay-sound	660	237	54	0	0	0	0	951	24
n_j	2129	1576	311	9	0	0	0	4025	100

Table 2

Matrix of pairwise interdistance mean coordinates of major depositional environments of the Mississippi Delta region. The interdistances are expressed in grid units where one grid unit equals approximately 1.5 miles.

	natural levee	point bar	swamp	marsh	beach	lacustrine
point bar	11					
swamp	8	11				
marsh	24	34	25			
beach	42	51	40	17		
lacustrine	21	26	16	18	28	
bay-sound	45	52	42	24	12	26

Table 3

Matrix of the number of nearest unlike neighbors for population sample from the Mississippi Delta region. The last row and column contain the row and column sums, respectively.

	natural levee	point bar	swamp	marsh	beach	lacus-trine	bay-sound	Σ
natural levee	-	117	286	148	0	2	0	553
point bar	38	-	5	2	0	0	1	46
swamp	301	10	-	175	1	138	12	637
marsh	538	3	168	-	29	320	281	1339
beach	0	0	0	9	-	0	8	17
lacus-trine	2	0	168	292	0	-	20	482
bay-sound	0	1	147	617	161	25	-	951
Σ	879	131	774	1243	191	485	322	4025

Figure 1. Depositional environments in Mississippi Delta region after Kolb, et al.[7].

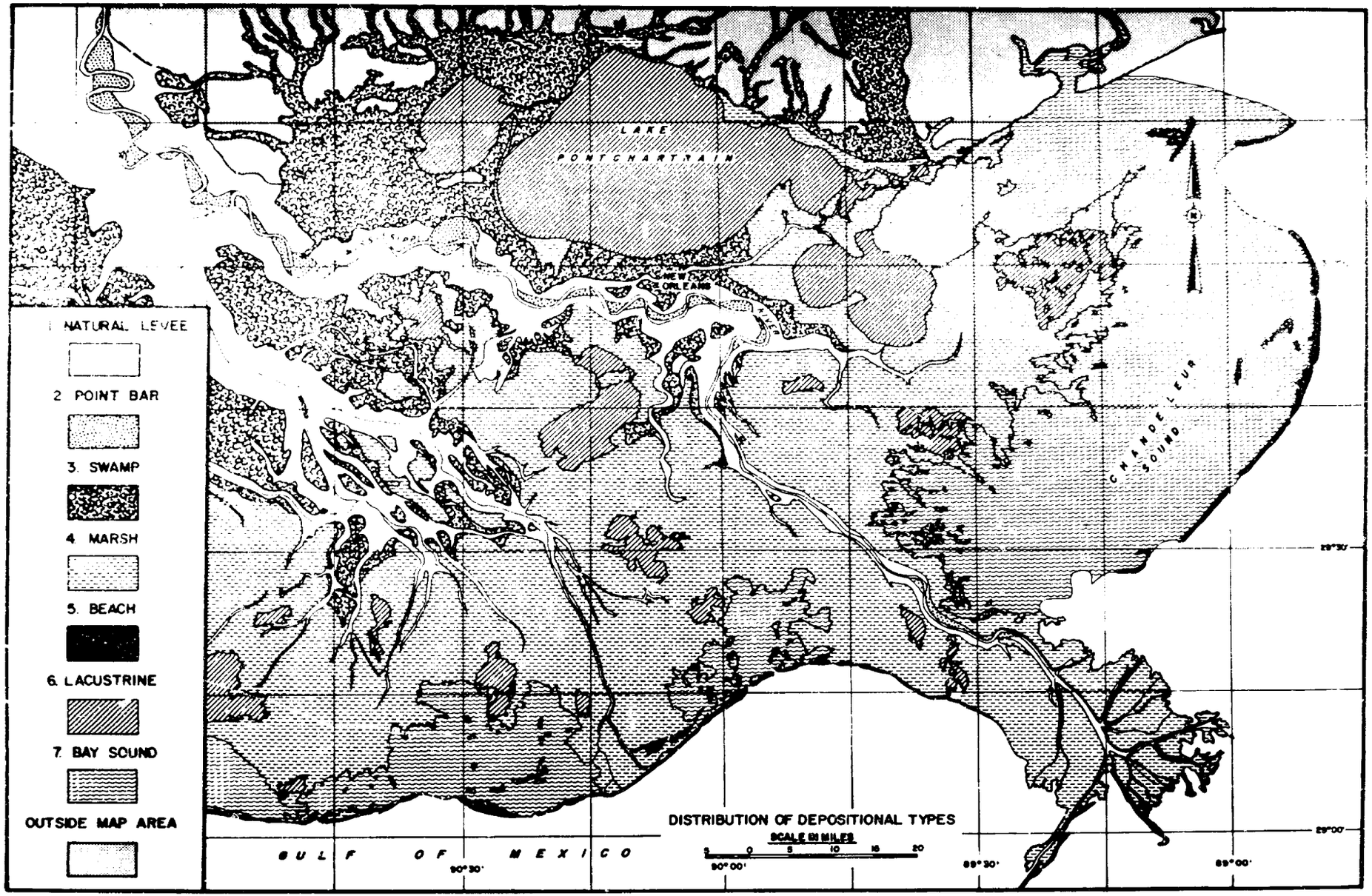
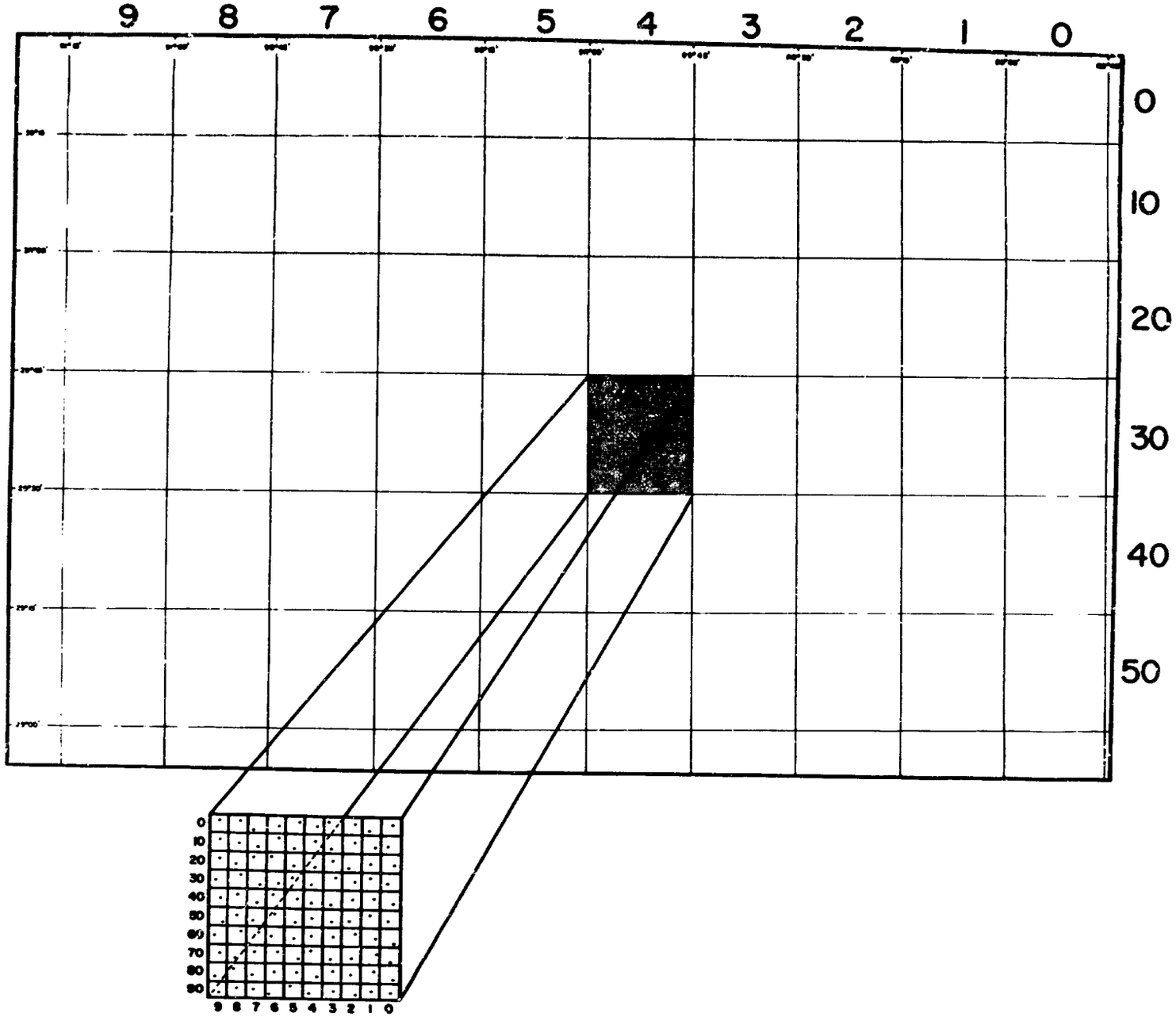

LAKE
PONTCHARTRAIN
NEW
ORLEANS
CHANDELEUR
SOUND
1. NATURAL LEVEE
2. POINT BAR
3. SWAMP
4. MARSH
5. BEACH
6. LACUSTRINE
7. BAY SOUND
OUTSIDE MAP AREA
GULF OF MEXICO
DISTRIBUTION OF DEPOSITIONAL TYPES
SCALE IN MILES
0 5 10 15 20
90°30'
90°00'
89°30'
89°00'
29°30'
29°00'
N

Figure 2. Grid overlay used to sample areal pattern in Figure 1. Each areal unit of observation is specified by a Block number defined for the coarser grid and by a Grid number defined for the finer grid. A randomly located point lies within each areal observation unit.


9 8 7 6 5 4 3 2 1 0
0
10
20
30
40
50

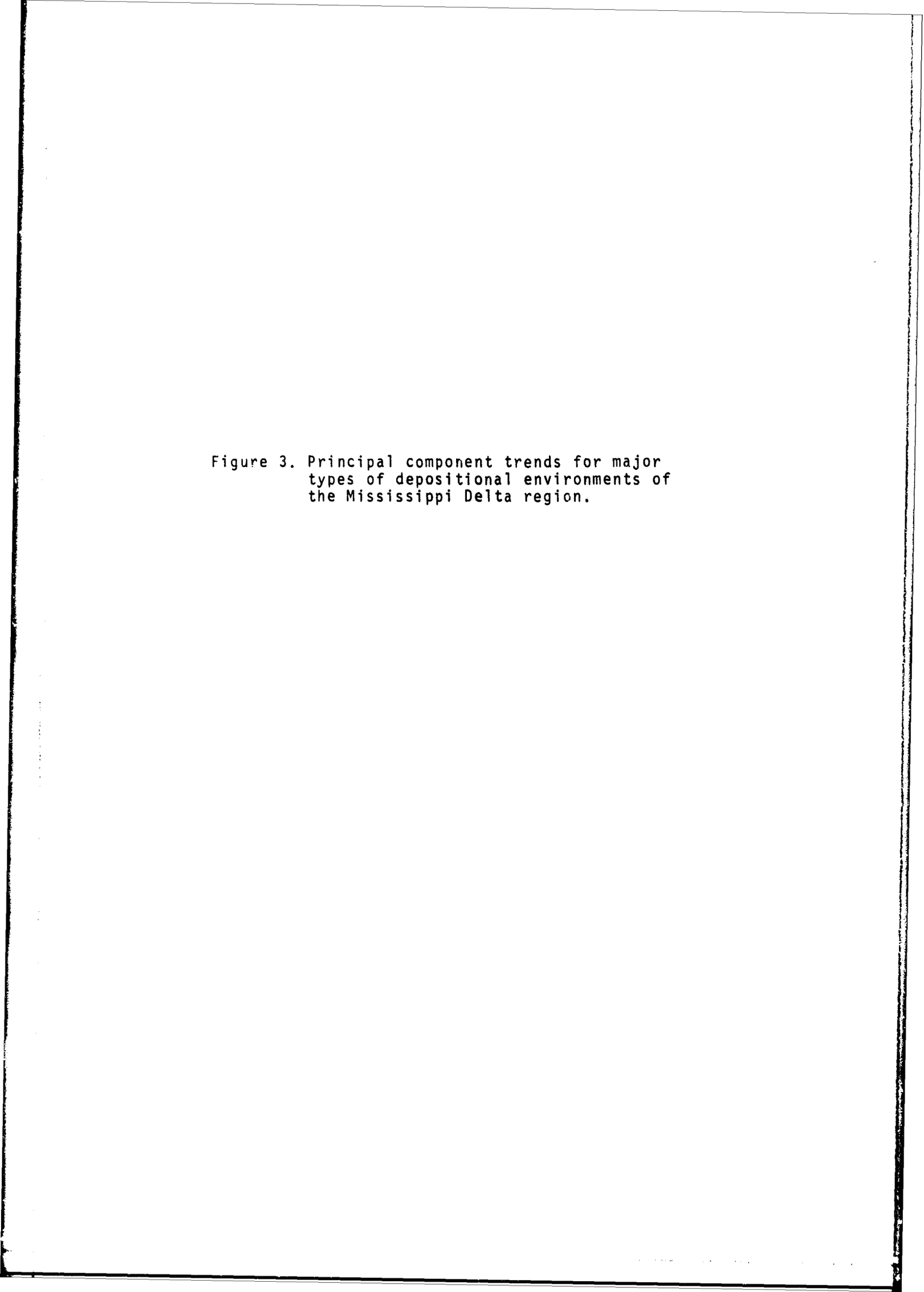


Figure 3. Principal component trends for major types of depositional environments of the Mississippi Delta region.

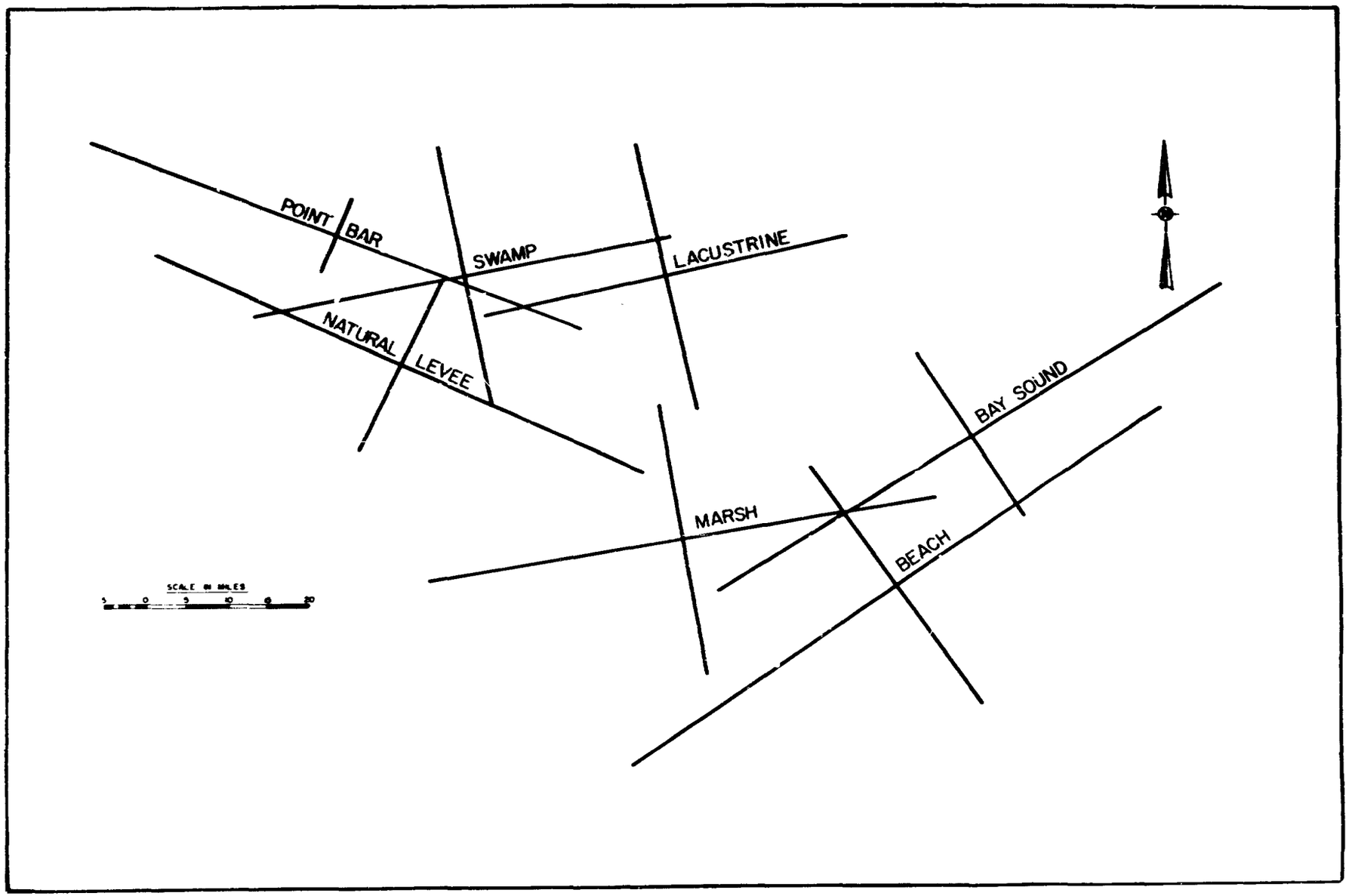

POINT BAR
SWAMP
LACUSTRINE
NATURAL LEVEE
BAY SOUND
MARSH
BEACH
SCALE IN MILES
5 0 5 10 15 20

Figure 4. Dendrograph depicting mutual relationships among environment mean coordinate locations in the Mississippi Delta region.

DENDROGRAPH FOR ENVIRONMENTAL PAIRWISE INTER-DISTANCE

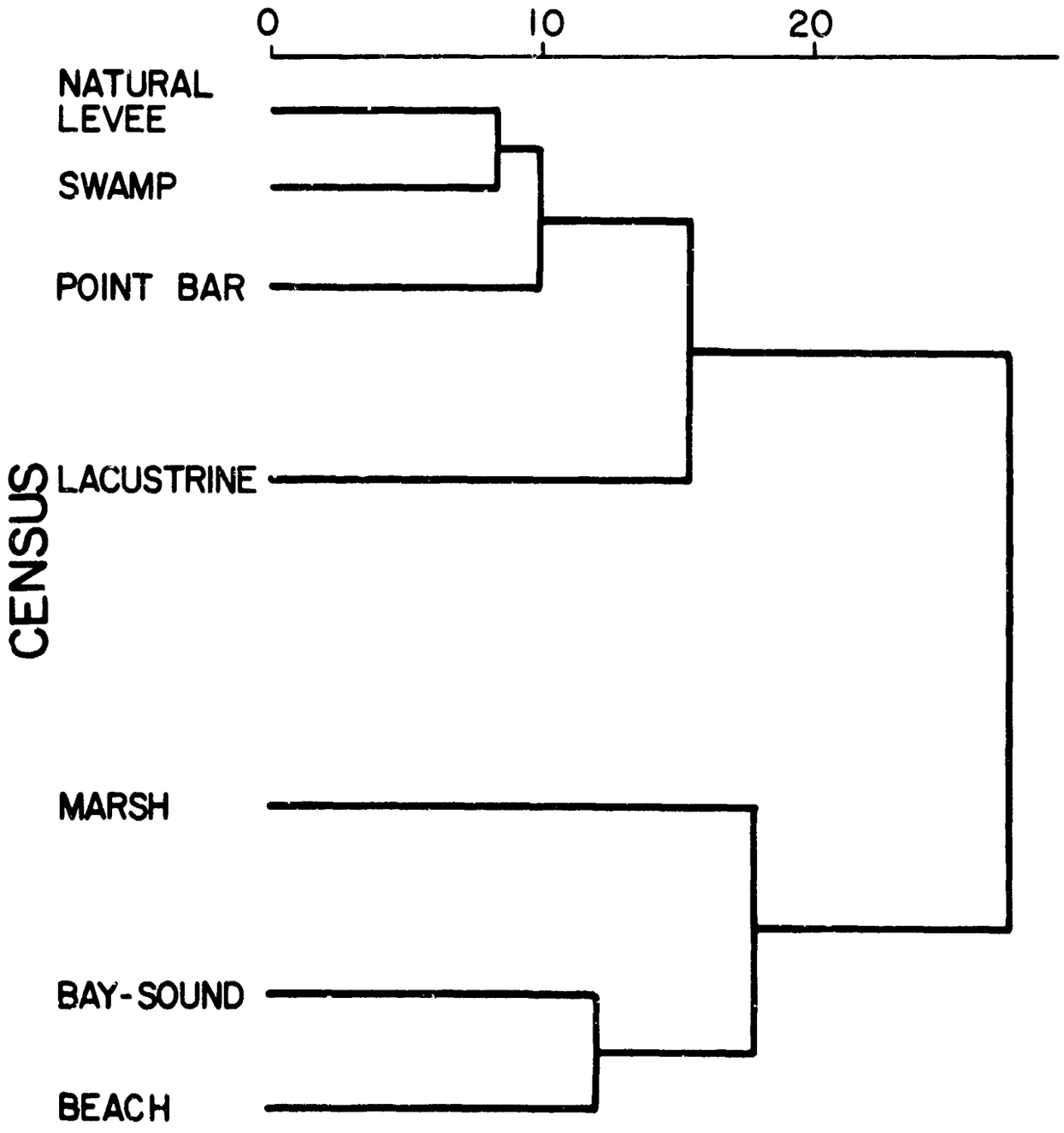


Figure 5. Dendrograph similar to Figure 4 based on random sample of 500 data locations.

DENDROGRAPH FOR ENVIRONMENTAL PAIRWISE INTER-DISTANCE

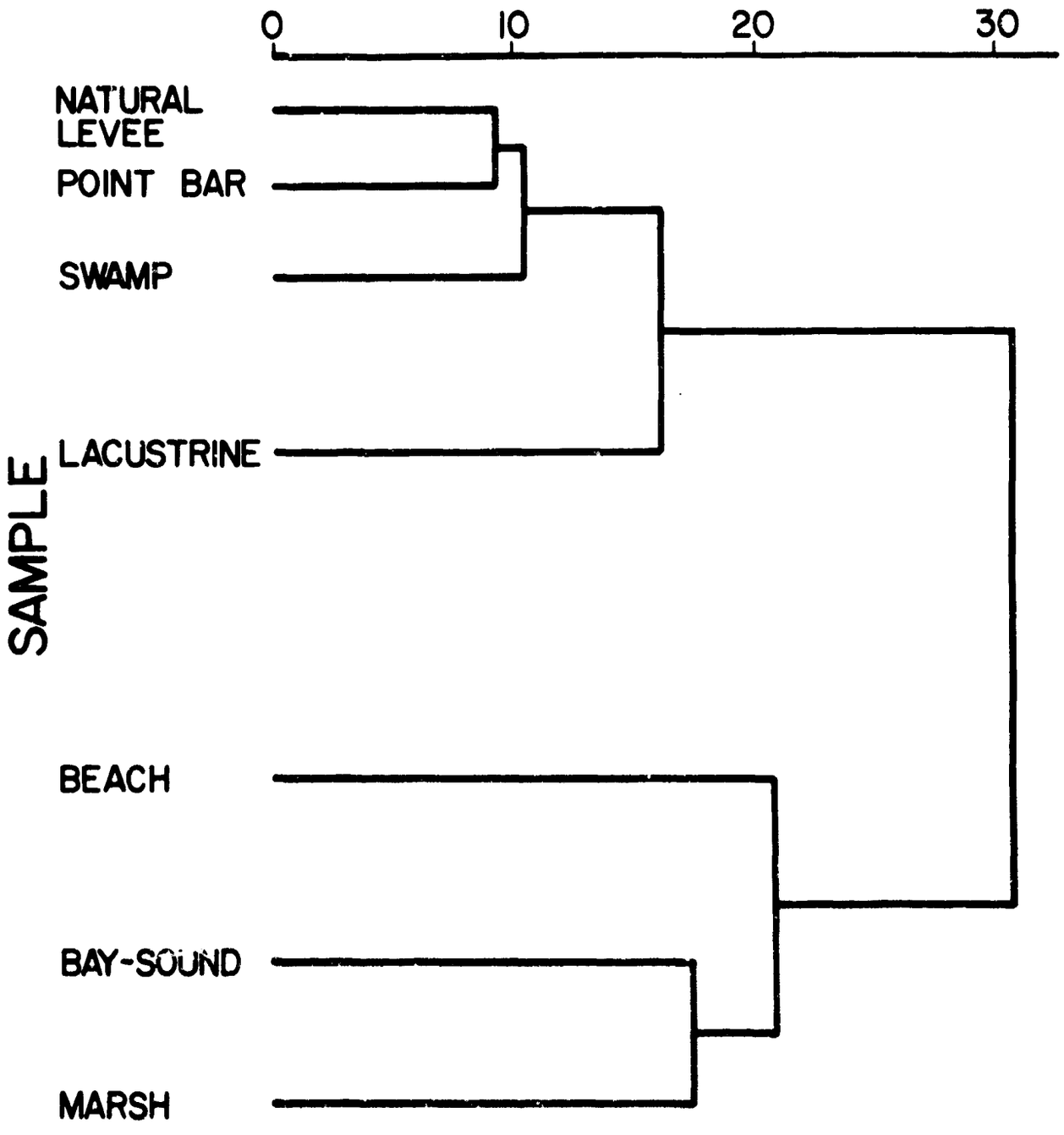


Figure 6. Proximal maps for Mississippi Delta region based on different size random samples. These computer drown maps were generated using the SYMAP program [9]. In the following maps, the symbols represent: #, natural levee; ',point bar; +,swamp; X, marsh; 0,beach; @,lacustrine; .,bay-sound.

a. Proximal map based on 5 random samples.

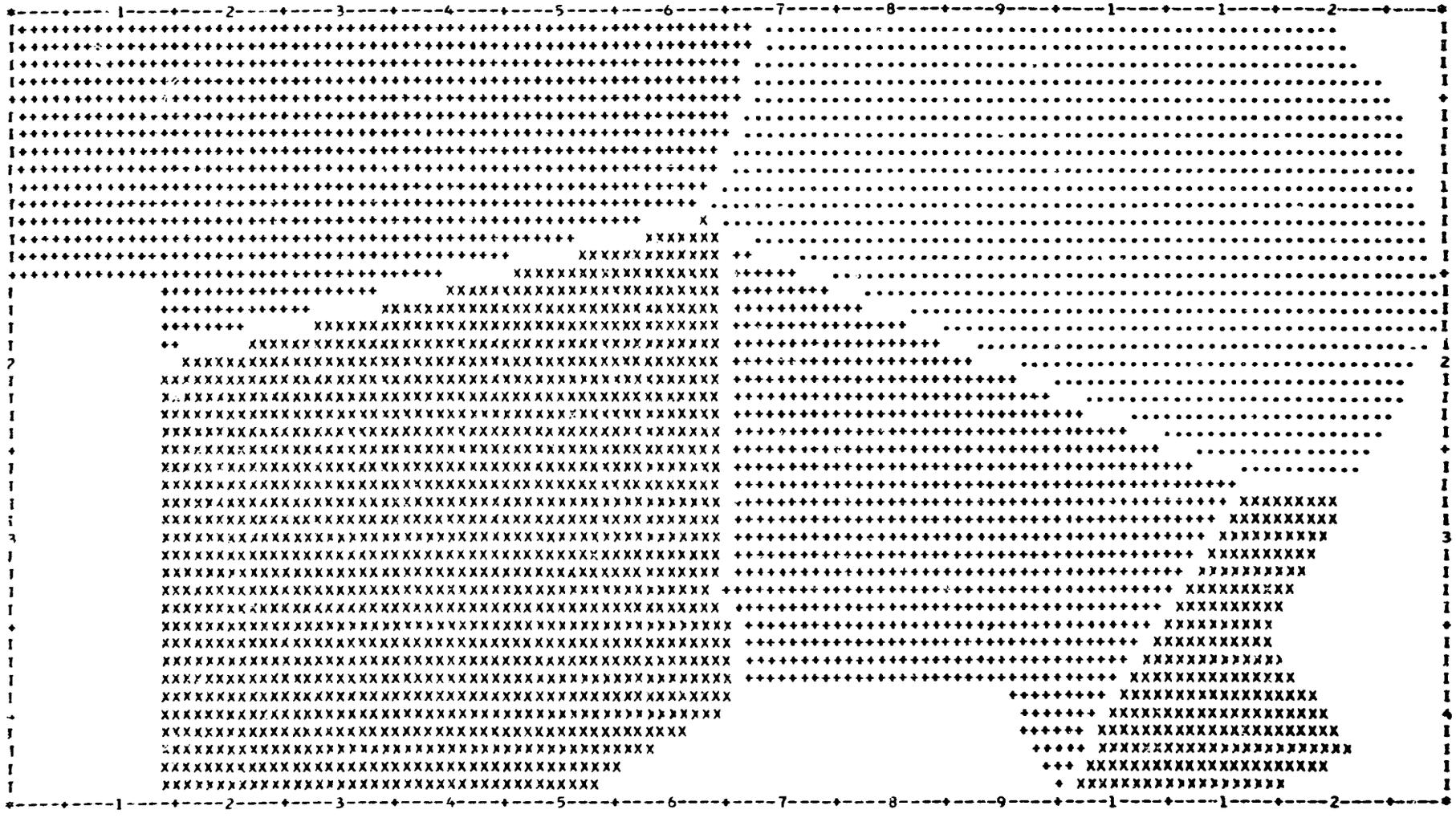


Figure 6b. Proximal map based on 10 random samples.

Figure 6c. Proximal map based on 20 random samples.

Figure 6d. Proximal map based on 50 random samples.

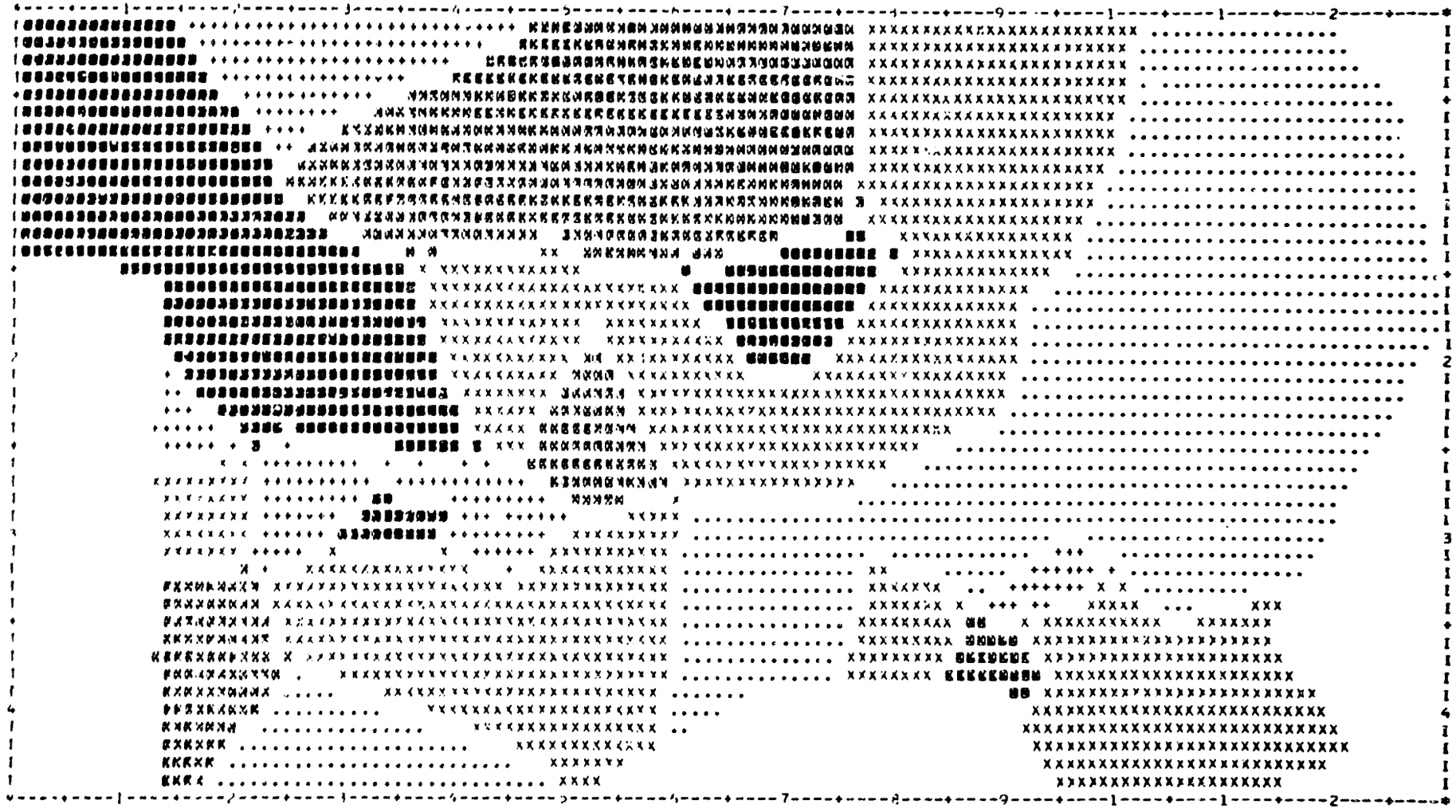


Figure 6e. Proximal map based on 100 random samples.

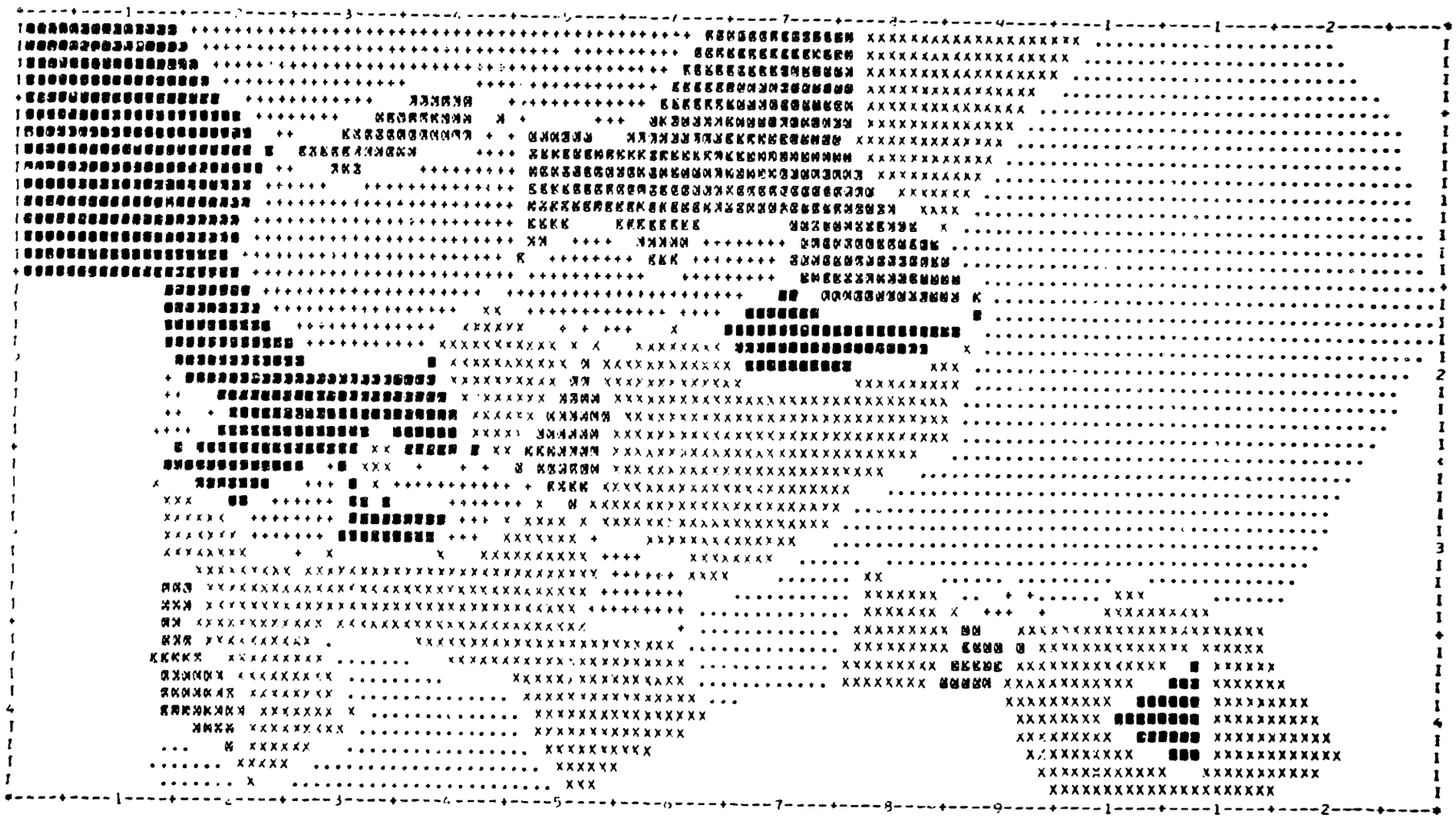


Figure 6f. Proximal map based on 200 random samples.

Figure 6g. Proximal map based on 500 random samples.

Figure 7. Proximal maps similar to those in Figure 6 with the same numbers of samples based on systematic sampling. For each size sample n, every [4025/n] sample location was chosen.

a. Proximal map based on 5 systematic samples.

Figure 7b. Proximal map based on 10 systematic samples.

Figure 7c. Proximal map based on 20 systematic samples.

Figure 7d. Proximal map based on 50 systematic samples.

Figure 7e. Proximal map based on 100 systematic samples.

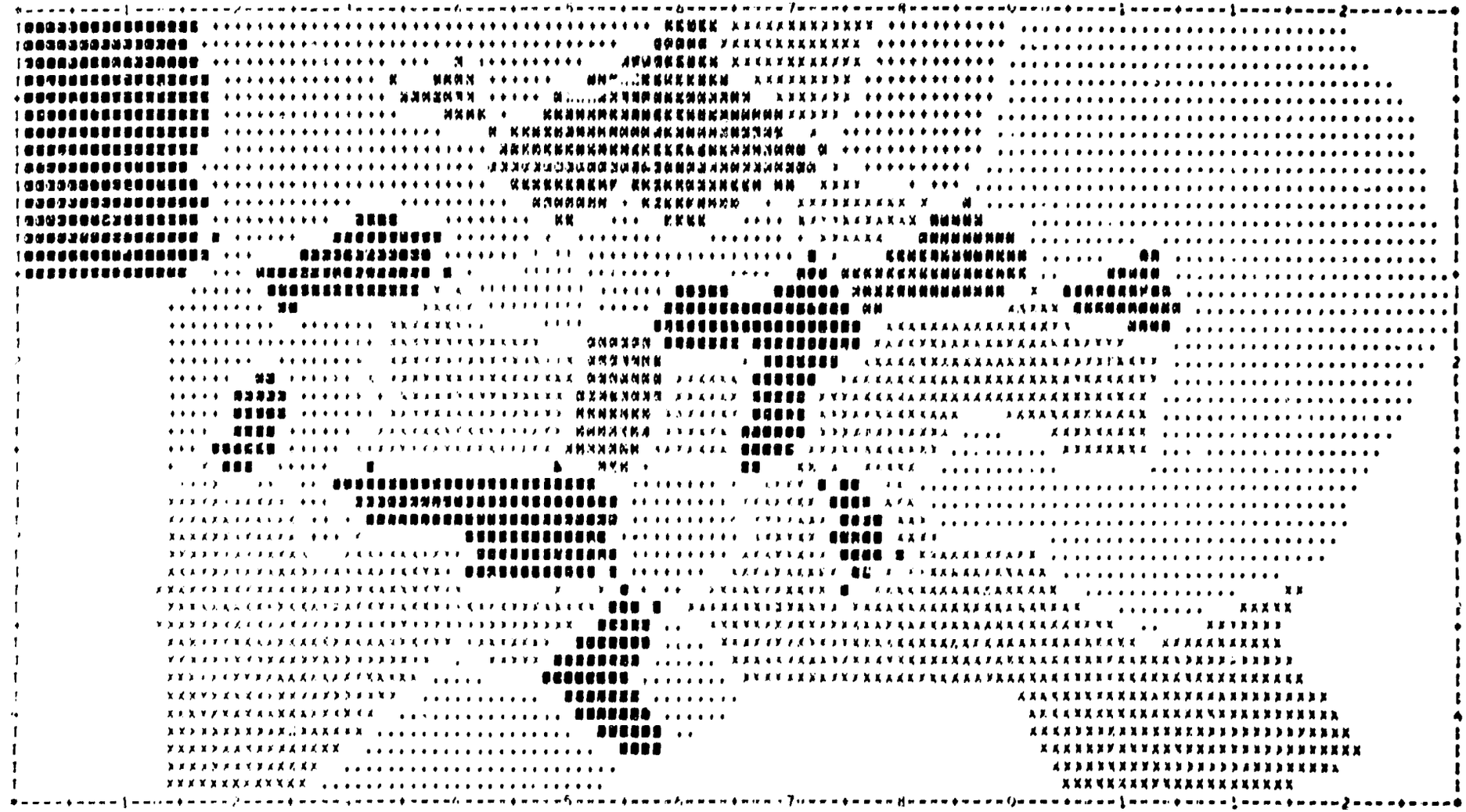


Figure 7f. Proximal map based on 200 systematic samples.

Figure 7g. Proximal map based on 500 systematic samples.

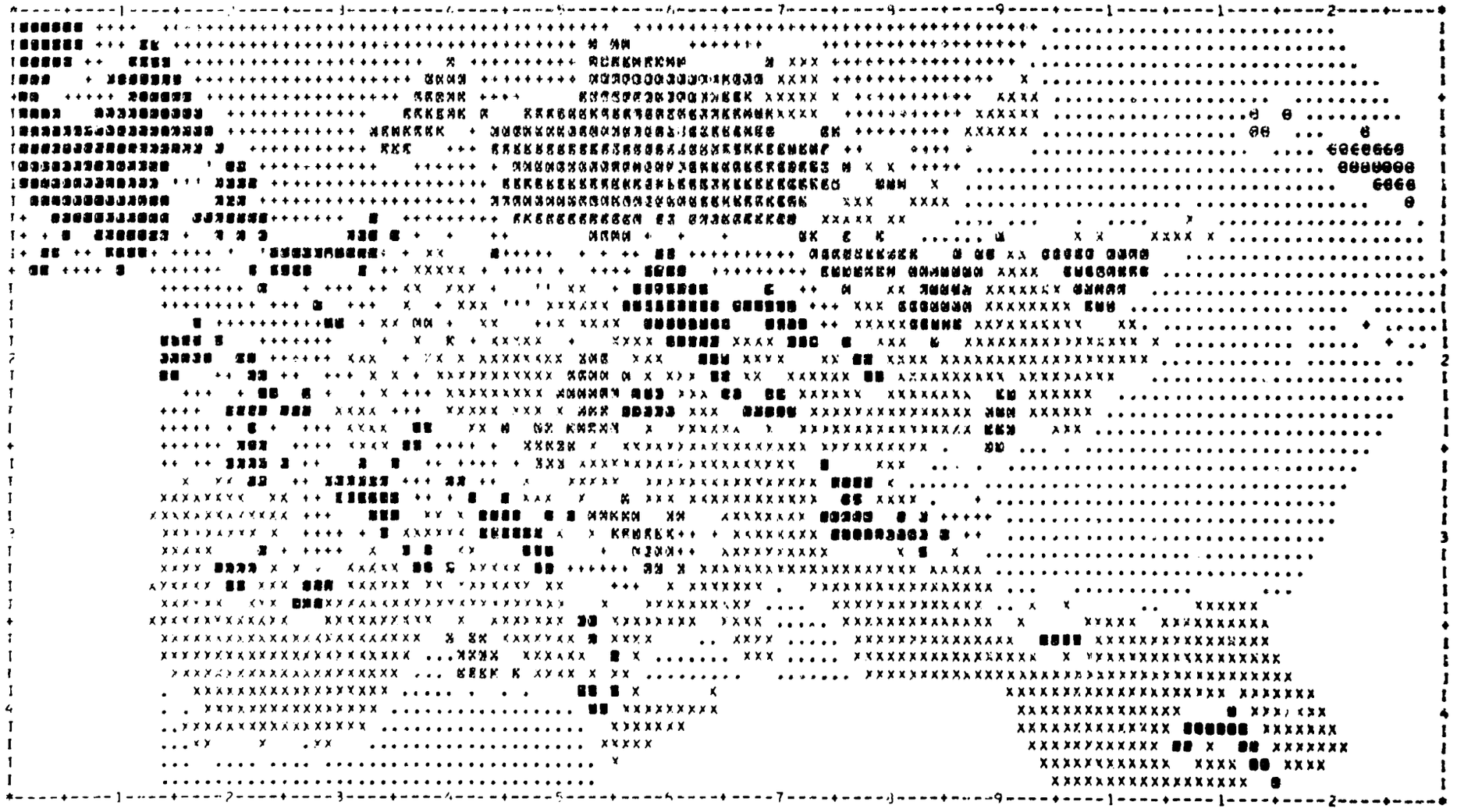


Figure 8. Variation of $\bar{\lambda}_b$ for repeat sampling for different sample sizes. The numbers on the right in the figure are the average values obtained for different size samples for 100 repeat samplings.

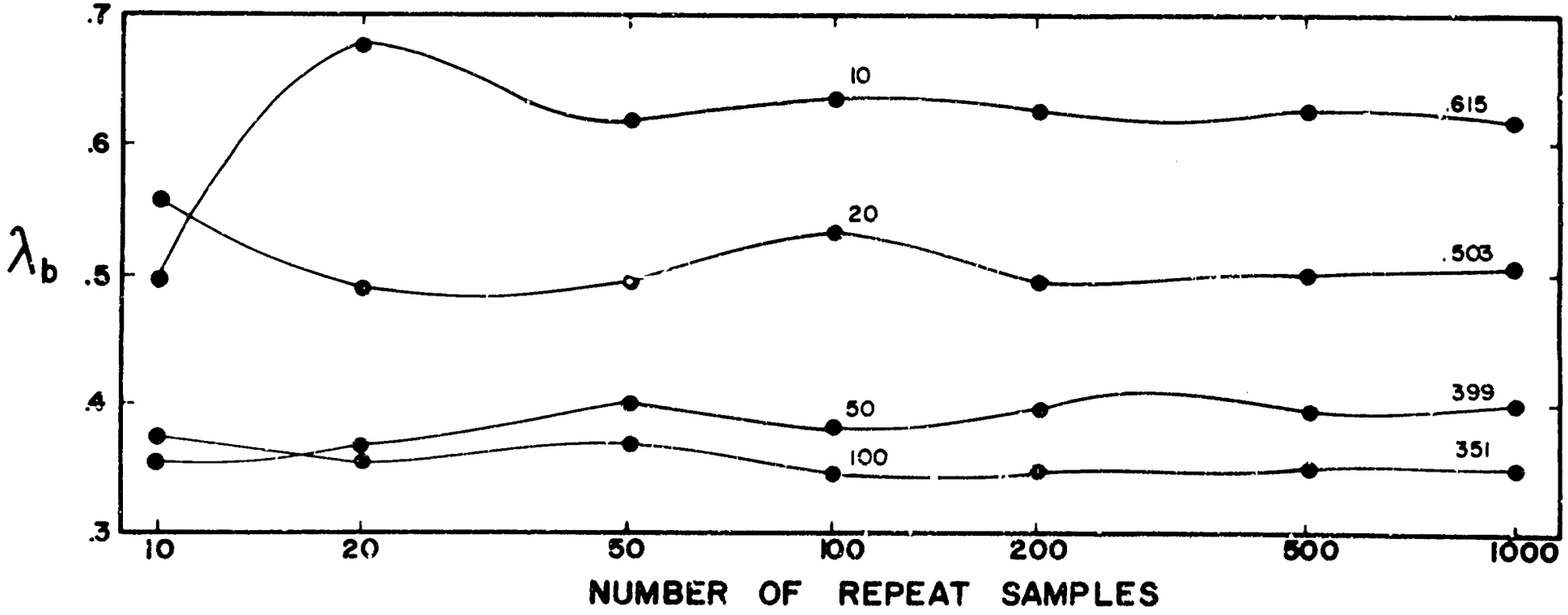
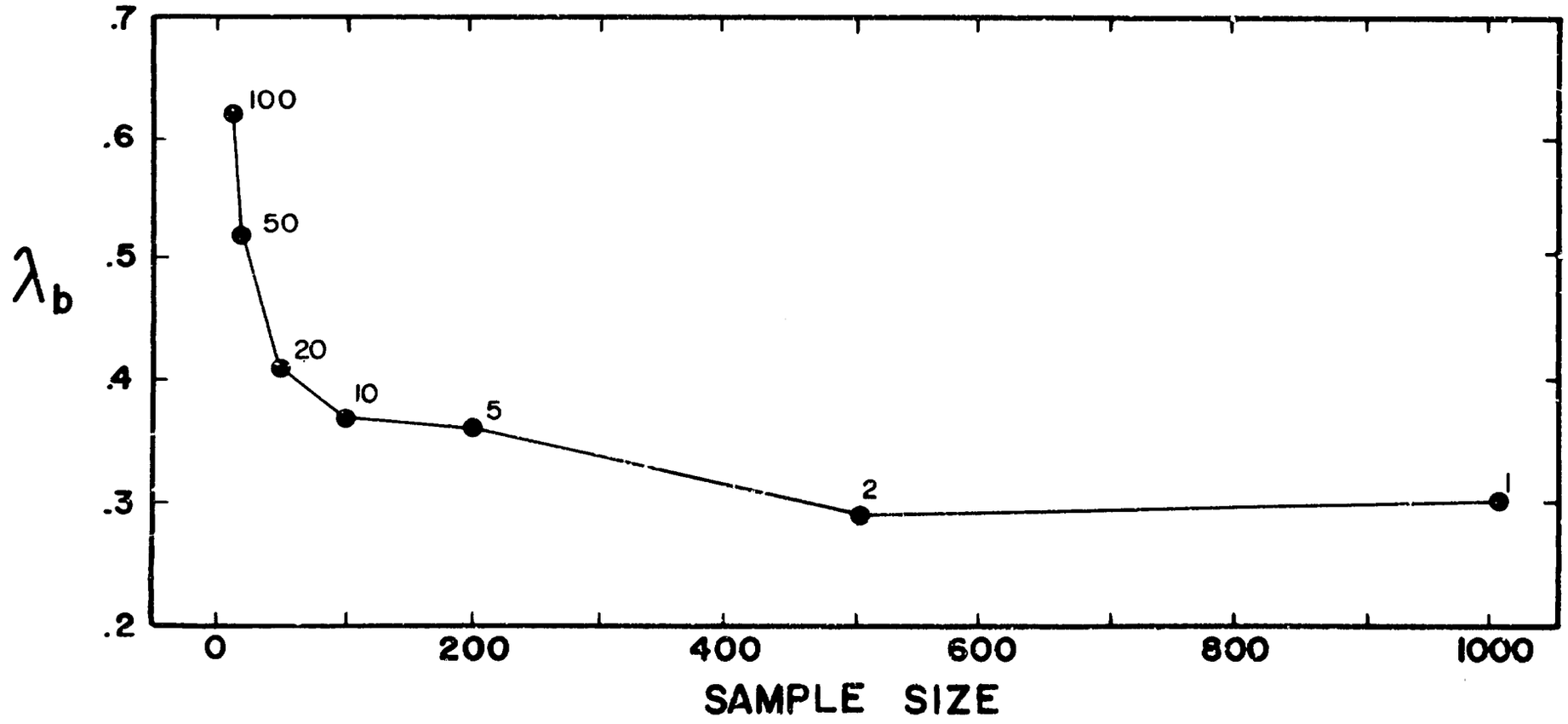

.7
.6
.5
.4
.3
λ_b
10
20
50
100
200
500
1000
NUMBER OF REPEAT SAMPLES
10
20
50
100
.615
.503
399
351

Figure 9. Variation of $\bar{\lambda}_b$ using product sampling rule as sample size increases. The different numbers of repeat sampling are shown in the figure.


.7
.6
.5
.4
.3
.2
λ_b
100
50
20
10
5
2
1
0
200
400
600
800
1000
SAMPLE SIZE

Appendix. Mississippi Delta environmental sample.

The Appendix contains a tabulation of the number and types of environments recorded for each of 4025 areal units of observation from the grid overlay shown in Figure 2 which was used to sample the areal pattern given in Figure 1. In the column headings, B refers to the Block number and G refers to the Grid number used to locate each areal observation unit in Figure 2. E refers to the type environment recorded at the randomly located point within each unit of observation. EVS refers to the set of environments found within each areal unit. The environments are arranged in the following order: natural levee, point bar, swamp, marsh, beach, lacustrine, and bay-sound. The presence or absence of a type environment within an areal unit is indicated by the number one or zero, respectively.

MISSISSIPPI DELTA ENVIRONMENTAL SAMPLE

B	G	E	EVS	B	G	E	EVS	B	G	E	EVS
0	89	7	0000001	0	96	7	0000001	0	97	7	0000001
0	98	7	0000001	0	99	7	0000001	1	29	3	0010000
1	38	3	0010000	1	48	3	0011000	1	69	4	0001000
1	72	7	0000001	1	73	7	0000001	1	74	7	0000001
1	75	7	0000001	1	76	7	0000001	1	77	7	0000001
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B	G	E	EVS	B	G	E	EVS	B	G	E	EVS
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B	G	E	EVS
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14	26	6	0CC0010
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14	59	6	0C00010
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14	71	4	0001010
14	74	1	1CC1000
14	77	4	0011000
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14	83	4	C0C1010
14	86	1	1001000
14	89	3	0010010
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15	13	6	0000010
15	16	6	0000010
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B	G	E	EVS
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13	66	7	0CC0001
13	69	4	0001010
13	72	7	CCC0001
13	75	7	0000001
13	78	6	0001010
13	81	7	CCCC001
13	84	7	0000001
13	87	6	CC00011
13	90	4	0C01001
13	93	7	0000001
13	96	6	CC00010
13	99	6	CC01C10
14	3	4	0C11000
14	6	6	CC01010
14	9	6	0000010
14	12	4	0001010
14	15	6	0C00010
14	18	6	0000010
14	21	6	0CC1010
14	24	6	0C00010
14	27	6	0000010
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14	33	6	0000010
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14	48	6	0C00C10
14	51	6	0C01010
14	54	6	1C01010
14	57	6	0000010
14	60	4	1001010
14	63	4	1C01000
14	66	4	0001010
14	69	6	0C00010
14	72	4	1C01010
14	75	4	1001000
14	78	3	0C1C01C
14	81	4	0001010
14	84	4	0001000
14	87	3	0C11000
14	90	6	0000010
14	93	6	0CC1010
14	96	4	0C01C10
14	99	3	1C11000
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15	5	6	0000010
15	8	6	0C00010
15	11	6	CC00010
15	14	6	0000010
15	17	6	CC00010
15	20	6	0000010
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B	G	E	EVS
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13	67	4	0001001
13	70	7	0000001
13	73	7	0000001
13	76	7	0C0C0C1
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13	82	7	0000001
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13	88	6	0001010
13	91	7	0001001
13	94	6	0000011
13	97	6	0000010
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14	4	4	0001010
14	7	6	0001010
14	10	3	00110CC
14	13	6	0001010
14	16	6	C000010
14	19	6	0000010
14	22	6	0000010
14	25	6	00C0010
14	28	6	0000010
14	31	6	C000010
14	34	6	0001010
14	37	6	0000010
14	40	4	0001010
14	43	6	0000010
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14	49	6	C000010
14	52	6	0000010
14	55	4	0001000
14	58	6	0C00010
14	61	4	1001010
14	64	4	1001000
14	67	4	0001010
14	70	4	0001000
14	73	4	1CC1000
14	76	4	0001000
14	79	6	001C010
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14	88	3	0010000
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15	6	6	0C00C10
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15	73	6	C000010
15	76	6	CCCC010
15	79	6	0000010
15	82	6	CC1C010
15	85	6	0000010
15	88	6	0011010
15	91	3	1C10000
15	94	3	0010010
15	97	4	0011010
16	0	6	0000010
16	3	6	0010010
16	6	4	CC11000
16	9	6	0000010
16	12	6	CCCC010
16	15	6	CC1C010
16	18	5	0001010
16	21	6	0000010
16	24	6	0000010
16	27	3	0011000
16	30	6	CCCC010
16	33	6	0000010
16	36	6	0000010
16	39	4	0011010
16	42	6	0000010
16	45	6	0000010
16	48	3	0010000
16	51	6	0000010
16	54	6	CCCC010
16	57	3	0011010
16	60	6	0000010
16	63	6	CCCC010
16	66	3	0011010
16	69	2	1110000
16	72	6	0001010
16	75	3	0011010
16	78	1	1110000
16	81	3	0011000
16	84	4	0011010

B	G	E	EVS
15	26	6	0000010
15	29	6	0000010
15	32	6	0000010
15	35	6	0000010
15	38	6	CC00010
15	41	6	0000010
15	44	6	0000010
15	47	6	CC00010
15	50	6	0000010
15	53	6	CC00010
15	56	6	0000010
15	59	6	0000010
15	62	6	CCCC010
15	65	6	0000010
15	68	6	0000010
15	71	6	0000010
15	74	6	0000010
15	77	6	CCCC010
15	80	3	0010010
15	83	6	0010010
15	86	6	0000010
15	89	4	0011010
15	92	3	1010000
15	95	3	0010010
15	98	3	0011000
16	1	6	0000010
16	4	6	0010010
16	7	6	0010010
16	10	6	CCCC010
16	13	6	0000010
16	16	4	0011010
16	19	6	0000010
16	22	6	0000010
16	25	6	0000010
16	28	3	0010010
16	31	6	0000010
16	34	6	0000010
16	37	4	0011010
16	40	6	0000010
16	43	6	0000010
16	46	6	0000010
16	49	3	0010000
16	52	6	0000010
16	55	6	0000010
16	58	3	0010010
16	61	6	0000010
16	64	6	0000010
16	67	3	0010000
16	70	6	0000010
16	73	6	0001010
16	76	3	0011000
16	79	2	0100000
16	82	4	0001000
16	85	3	0010000

B	G	E	EVS
15	27	6	0000010
15	30	6	0000010
15	33	6	0000010
15	36	6	0000010
15	39	6	0000010
15	42	6	0000010
15	45	6	0000010
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15	63	6	0000010
15	66	6	0000010
15	69	6	0000010
15	72	6	0000010
15	75	6	0000010
15	78	6	0000010
15	81	3	0010010
15	84	6	0010010
15	87	6	0011010
15	90	3	1010000
15	93	3	0010000
15	96	3	0010010
15	99	3	0011000
16	2	6	0000010
16	5	3	0011010
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16	11	6	0000010
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16	26	4	0011010
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16	38	3	0011000
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16	47	3	0011010
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16	53	6	0000010
16	56	6	0001010
16	59	3	0110000
16	62	6	0000010
16	65	6	0000010
16	68	3	1010000
16	71	6	0001010
16	74	6	0001010
16	77	3	1010000
16	80	3	0011000
16	83	4	0001000
16	86	3	1010000

B	G	E	EVS
16	87	1	1010000
16	90	3	0011000
16	93	4	0011000
16	96	1	1010000
16	99	1	1100000
17	2	5	0010010
17	5	3	0010000
17	8	3	0010000
17	11	6	0000010
17	14	3	0010010
17	17	3	0010000
17	20	6	0000010
17	23	3	0010010
17	26	3	0010000
17	29	3	0010000
17	32	3	0011010
17	35	3	0010000
17	38	3	0010000
17	41	3	0010010
17	44	3	0010000
17	47	3	0010000
17	50	3	0110000
17	53	3	0010000
17	56	3	0010000
17	59	3	0010000
17	62	3	0010000
17	65	3	1010000
17	68	3	0010000
17	71	2	0100000
17	74	1	1000000
17	77	1	1010000
17	80	1	1100000
17	83	1	1000000
17	86	1	1000000
17	89	1	1000000
17	92	1	1010000
17	95	1	1000000
17	98	1	1000000
18	1	3	0010000
18	9	3	0010000
18	12	3	0010000
18	21	3	0010000
18	28	1	1000000
18	31	3	0010000
18	36	1	1000000
18	39	1	1000000
18	42	3	0010000
18	45	1	1000000
18	48	1	1100000
18	51	3	0010000
18	54	1	1010000
18	57	1	1100000
18	60	3	0010000
18	63	1	1010000

B	G	E	EVS
16	88	1	1100000
16	91	3	0010000
16	94	3	0010000
16	97	1	1100000
17	0	6	0000010
17	3	3	0010010
17	6	3	0010000
17	9	3	0010000
17	12	6	0010010
17	15	3	0010000
17	18	3	0010000
17	21	6	0000010
17	24	3	0010000
17	27	3	0010000
17	30	4	0011010
17	33	3	0010000
17	36	3	0010000
17	39	3	0010000
17	42	3	0010000
17	45	3	0010000
17	48	3	0010000
17	51	3	0010000
17	54	3	0010000
17	57	3	0010000
17	60	2	0100000
17	63	3	1010000
17	66	3	1010000
17	69	3	0010000
17	72	2	0100000
17	75	1	1000000
17	78	1	1010000
17	81	2	0100000
17	84	1	1000000
17	87	1	1000000
17	90	1	1000000
17	93	1	1010000
17	96	1	1000000
17	99	1	1100000
18	2	3	0010000
18	10	3	0010000
18	13	3	0010000
18	22	3	0010000
18	29	1	1000000
18	32	3	0010000
18	37	1	1000000
18	40	3	0010000
18	43	3	0010000
18	46	1	1000000
18	49	1	1100000
18	52	3	0010000
18	55	1	1000000
18	58	2	1100000
18	61	3	0010000
18	64	1	1000000

B	G	E	EVS
16	89	1	1100000
16	92	4	0011000
16	95	3	0010000
16	98	1	1100000
17	1	6	0000010
17	4	3	0010000
17	7	3	0010000
17	10	6	0000010
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17	16	3	0010000
17	19	3	0010000
17	22	6	0000010
17	25	3	0010000
17	28	3	0010000
17	31	3	0011010
17	34	3	0010000
17	37	3	0010000
17	40	3	0010010
17	43	3	0010000
17	46	3	0010000
17	49	3	0010000
17	52	3	0010000
17	55	3	0010000
17	58	3	0010000
17	61	2	0110000
17	64	3	1010000
17	67	3	0010000
17	70	2	0100000
17	73	1	1000000
17	76	1	1000000
17	79	3	1010000
17	82	1	1100000
17	85	1	1000000
17	88	1	1000000
17	91	1	1000000
17	94	1	1000000
17	97	1	1000000
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18	30	3	0010000
18	33	3	0010000
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18	41	3	0010000
18	44	1	1010000
18	47	2	1100000
18	50	3	0010000
18	53	3	1010000
18	56	1	1100000
18	59	1	1100000
18	62	3	1010000
18	65	1	1100000

B	G	E	EVS
18	66	1	1100000
18	69	1	1000000
18	72	1	1010000
18	75	1	1100000
18	78	1	1000000
18	81	1	1010000
18	84	2	1100000
18	87	3	1010000
18	90	2	1100000
18	93	1	1000000
18	96	3	0010000
18	99	1	1010000
19	2	1	1000000
19	5	2	1100000
19	8	1	1000000
19	11	2	1100000
19	14	1	1100000
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19	74	1	1000000
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19	86	1	1010000
19	89	3	0010000
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19	98	3	0010000
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20	12	7	0010001
20	15	7	0000001
20	18	7	0000001
20	24	7	0000001
20	27	7	0000001
20	33	7	0010001
20	36	7	0000001

B	G	E	EVS
18	67	1	1000000
18	70	3	1010000
18	73	1	1000000
18	76	1	1000000
18	79	1	1000000
18	82	1	1110000
18	85	1	1000000
18	88	3	1010000
18	91	2	1100000
18	94	1	1100000
18	97	3	0010000
19	0	1	1010000
19	3	1	1000000
19	6	1	1100000
19	9	1	1000000
19	12	1	1100000
19	15	2	1100000
19	18	1	1000000
19	21	2	1100000
19	24	1	1100000
19	27	1	1000000
19	30	2	1100000
19	33	1	1000000
19	36	1	1000000
19	39	1	1000000
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19	69	3	1010000
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19	78	3	1010000
19	81	1	1000000
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19	87	3	1010000
19	90	1	1010000
19	93	1	1000000
19	96	1	1010000
19	99	3	0010000
20	5	7	0000001
20	8	7	0000001
20	13	7	0010001
20	16	7	0000001
20	19	7	0000001
20	25	7	0000001
20	28	7	0000001
20	34	7	0000001
20	37	7	0000001

B	G	E	EVS
18	68	1	1000000
18	71	3	1010000
18	74	1	1100000
18	77	1	1000000
18	80	1	1000000
18	83	1	1100000
18	86	1	1010000
18	89	1	1010000
18	92	2	0100000
18	95	3	1010000
18	98	3	1010000
19	1	1	1000000
19	4	1	1100000
19	7	1	1000000
19	10	1	1000000
19	13	2	1100000
19	16	1	1100000
19	19	1	1000000
19	22	1	1100000
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19	37	1	1000000
19	40	2	1100000
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19	49	3	1010000
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19	64	1	1000000
19	67	1	1010000
19	70	1	1000000
19	73	1	1000000
19	76	1	1010000
19	79	3	0010000
19	82	1	1000000
19	85	1	1000000
19	88	3	0010000
19	91	1	1000000
19	94	1	1000000
19	97	1	1010000
20	3	7	0010101
20	6	7	0000001
20	9	7	0000001
20	14	7	0000001
20	17	7	0000001
20	23	7	0010001
20	26	7	0000001
20	29	7	0000001
20	35	7	0000001
20	38	7	0000001

B	G	E	EVS
20	39	7	CCCCC001
20	45	7	0010001
20	48	7	0000001
20	54	7	CC10001
20	57	7	0010001
20	63	3	0010101
20	66	7	0000001
20	69	7	0010001
20	75	7	CCCCC001
20	78	7	0000001
20	85	7	0000001
20	88	7	0000001
20	95	7	0000001
20	98	7	CCCCCC1
21	1	7	0000001
21	4	7	0000001
21	7	7	CCCCC001
21	10	7	0000001
21	13	7	C000001
21	16	7	C000001
21	19	4	0001001
21	22	7	00CC001
21	25	7	00CC001
21	28	7	00C0001
21	32	7	0CCC001
21	35	7	0000001
21	38	7	0000001
21	41	7	0000001
21	44	7	0000001
21	47	7	CCCCC001
21	50	7	0000001
21	53	7	0000001
21	56	7	0C0C001
21	59	7	0000001
21	62	7	0000001
21	65	7	0000001
21	68	7	0000001
21	71	7	00CC001
21	74	7	0000001
21	77	7	0000001
21	80	7	0000001
21	83	7	0000001
21	86	7	00C0001
21	89	7	0000001
21	92	7	0000001
21	95	7	0C00001
21	98	7	0000001
22	1	6	0001010
22	4	6	0001010
22	7	6	0001010
22	10	4	CCC1000
22	13	6	C001010
22	16	6	C001010
22	19	4	CCC1000
20	43	7	0011001
20	46	7	CC0C001
20	49	7	0000001
20	55	7	CC00001
20	58	7	CC00001
20	64	7	0C10001
20	67	7	CC00001
20	73	3	0C10101
20	76	7	0000001
20	79	7	0C10001
20	86	7	0000001
20	89	7	CC10001
20	96	7	0C00001
20	99	7	0000001
21	2	7	CC00001
21	5	7	0000001
21	8	7	0001011
21	11	7	CC000C1
21	14	7	C000001
21	17	7	0C01001
21	20	7	0CC00C1
21	23	7	0000001
21	26	7	0C00001
21	30	7	0000001
21	33	7	CCC0001
21	36	7	CCC0001
21	39	7	0000001
21	42	7	0C00001
21	45	7	0000001
21	48	7	0001001
21	51	7	0CC00C1
21	54	7	0000001
21	57	7	0C00001
21	60	7	0C00001
21	63	7	0000001
21	66	7	0CC0001
21	69	7	0010001
21	72	7	0000001
21	75	7	0C00001
21	78	7	0000001
21	81	7	CC00001
21	84	7	0CC0001
21	87	7	0000001
21	90	7	0C00001
21	93	7	0000001
21	96	7	0000001
21	99	7	0C00001
22	2	6	0001010
22	5	6	CC00010
22	8	4	0001010
22	11	4	0001010
22	14	6	CC01010
22	17	4	0001010
22	20	4	0001001
20	44	7	0010001
20	47	7	0000001
20	53	7	0C1C101
20	56	3	0010001
20	59	7	0000001
20	65	7	0000001
20	68	7	0010001
20	74	7	CC100C1
20	77	7	0000001
20	84	3	0C10101
20	87	7	0000001
20	94	7	0010101
20	97	7	0C00001
21	0	7	0000001
21	3	7	0C00001
21	6	7	000000C1
21	9	6	0001011
21	12	7	0000001
21	15	7	0000001
21	18	7	0001001
21	21	7	0000001
21	24	7	0000001
21	27	7	0000001
21	31	7	CCCCCC1
21	34	7	0001001
21	37	7	0000001
21	40	7	0000001
21	43	7	0000001
21	46	7	0000001
21	49	7	0001001
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21	67	7	0000001
21	70	7	0CCC001
21	73	7	0000001
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21	94	7	0000001
21	97	7	0000001
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22	3	6	0001010
22	6	6	0000010
22	9	4	0001000
22	12	6	0001010
22	15	4	0001010
22	18	4	0001010
22	21	4	0001000

B	G	E	EVS
22	21	6	0001010
22	25	4	0001010
22	28	4	0001000
22	31	7	0001001
22	34	6	0001010
22	37	4	0001000
22	40	7	0001001
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22	88	7	0001001
22	91	4	0001001
22	94	7	0001001
22	97	4	0001001
23	0	4	0001000
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23	63	4	1001000
23	66	4	1001000
23	69	4	1001000
23	72	4	0001000
23	75	1	1001000
23	78	4	0001000
23	81	4	0001000

B	G	E	EVS
22	23	6	0001010
22	26	4	0001000
22	29	4	0001000
22	32	4	0001011
22	35	4	0001010
22	38	4	0001000
22	41	7	0001001
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23	43	4	0001010
23	46	6	0000010
23	49	4	0001010
23	52	4	0001000
23	55	4	0001010
23	58	4	1001010
23	61	4	1001000
23	64	4	1001000
23	67	1	1001000
23	70	4	0001000
23	73	4	0001000
23	76	1	1001000
23	79	4	0001000
23	82	4	0001000

B	G	E	EVS
22	24	6	0001010
22	27	4	0001000
22	30	7	0001001
22	33	6	0001010
22	36	4	0001000
22	39	4	0001000
22	42	7	0001001
22	45	4	0001000
22	48	4	0001000
22	51	4	0001001
22	54	4	0001000
22	57	4	0001000
22	60	7	0010001
22	63	4	0001001
22	66	4	0001000
22	69	4	0001000
22	72	7	0001001
22	75	4	0001001
22	78	4	0001000
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22	84	4	0001001
22	87	7	0001001
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22	99	4	0001000
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23	44	6	0001010
23	47	6	0000010
23	50	4	0001000
23	53	4	0001000
23	56	6	0001010
23	59	1	1011010
23	62	4	1001000
23	65	4	0001000
23	68	1	1001000
23	71	4	0001000
23	74	1	1001000
23	77	4	1001000
23	80	4	0001000
23	83	4	0001000

B	G	E	EVS
23	84	4	0001000
23	87	4	0001000
23	90	4	0001000
23	93	4	0001010
23	96	4	0001000
23	99	4	1001000
24	2	6	0000010
24	5	4	0001000
24	8	4	0011000
24	11	6	0000010
24	14	4	0001000
24	17	3	0011000
24	20	4	0001010
24	23	6	0001010
24	26	3	1011000
24	29	1	1100000
24	32	4	0011000
24	35	1	1010000
24	38	1	1000000
24	41	3	1011000
24	44	3	1010000
24	47	1	1100000
24	50	3	1011000
24	53	4	1001000
24	56	1	1101000
24	59	1	1000000
24	62	4	0001000
24	65	4	0001000
24	68	3	1011000
24	71	4	0001000
24	74	4	0001010
24	77	4	0001000
24	80	4	1001000
24	83	6	0001010
24	86	4	0001000
24	89	3	1011000
24	92	4	1001000
24	95	4	0001000
24	98	4	1011000
25	1	3	1010000
25	4	3	1010000
25	7	3	1010000
25	10	1	1010000
25	13	3	1010000
25	16	1	1010000
25	19	1	1100000
25	22	2	1100000
25	25	1	1110000
25	28	1	1100000
25	31	1	1100000
25	34	1	1100000
25	37	3	1110000
25	40	3	1010000
25	43	1	1010000

B	G	E	EVS
23	85	4	1001000
23	88	4	0001000
23	91	4	0001000
23	94	4	0001010
23	97	4	0001000
24	0	6	0000010
24	3	6	0000010
24	6	4	0001000
24	9	3	0011000
24	12	6	0000010
24	15	4	0001000
24	18	3	1011000
24	21	6	0001010
24	24	3	0011000
24	27	1	1010000
24	30	4	0001000
24	33	4	0011000
24	36	1	1100000
24	39	1	1010000
24	42	3	1010000
24	45	1	1010000
24	48	1	1100000
24	51	1	1011000
24	54	1	1001000
24	57	1	1111000
24	60	1	1001000
24	63	4	0001000
24	66	4	0001000
24	69	1	1000000
24	72	4	0001010
24	75	4	0001000
24	78	4	1011000
24	81	4	1001000
24	84	6	0001010
24	87	4	0001000
24	90	4	1001000
24	93	4	0001000
24	96	4	0001000
24	99	3	1011000
25	2	3	1010000
25	5	3	1010000
25	8	3	1011000
25	11	1	1110000
25	14	3	1010000
25	17	3	1010000
25	20	2	1100000
25	23	3	1110000
25	26	1	1100000
25	29	1	1000000
25	32	1	1100000
25	35	1	1100000
25	38	1	1111000
25	41	3	1010000
25	44	1	1000000

B	G	E	EVS
23	86	4	0001000
23	89	4	0001000
23	92	4	0001000
23	95	4	0001010
23	98	4	1001000
24	1	6	0000010
24	4	4	0001010
24	7	4	0001000
24	10	6	0000010
24	13	6	0001010
24	16	4	0011000
24	19	3	1010000
24	22	6	0001010
24	25	3	0011000
24	28	2	1100000
24	31	4	0011000
24	34	3	0011000
24	37	1	1100000
24	40	4	0011000
24	43	3	1010000
24	46	2	1100000
24	49	3	1010000
24	52	1	1011000
24	55	1	1001000
24	58	2	1110000
24	61	4	1001000
24	64	4	0001000
24	67	4	0001000
24	70	1	1001000
24	73	6	0001010
24	76	4	0001000
24	79	1	1010000
24	82	4	0001010
24	85	4	0001000
24	88	4	1011000
24	91	1	1001000
24	94	4	0001000
24	97	4	0001000
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25	3	3	1010000
25	6	3	1010000
25	9	3	1010000
25	12	1	1110000
25	15	1	1010000
25	18	3	1010000
25	21	1	1100000
25	24	3	1010000
25	27	1	1100000
25	30	1	1010000
25	33	2	1100000
25	36	3	1010000
25	39	4	1001000
25	42	1	1010000
25	45	1	1010000

B	G	E	EVS
25	46	3	1011000
25	47	4	0011000
25	48	4	0011000
25	49	4	0001000
25	50	1	1000000
25	51	3	1010000
25	52	3	0010000
25	53	3	1010000
25	54	1	1010000
25	55	3	0011000
25	56	4	0001000
25	57	4	0011000
25	58	4	0011010
25	59	6	0001010
25	60	1	1000000
25	61	1	1010000
25	62	3	1011000
25	63	4	0011000
25	64	1	1011000
25	65	4	1011000
25	66	4	0001010
25	67	4	0001010
25	68	6	0001010
25	69	6	0000010
25	70	1	1000000
25	71	1	1010000
25	72	3	1011000
25	73	3	1011000
25	74	4	1011000
25	75	4	1001000
25	76	4	0001010
25	77	4	0001010
25	78	4	0001010
25	79	6	0001010
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25	84	4	1001000
25	85	4	1001000
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25	87	6	0000010
25	88	6	0001010
25	89	4	0001010
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25	91	1	1010000
25	92	4	0011000
25	93	3	1011000
25	94	4	1011000
25	95	1	1011000
25	96	6	0001010
25	97	6	0000010
25	98	6	0000010
25	99	6	0001010
26	0	3	1010000
26	1	1	1010000
26	2	3	1011000
26	3	3	0011000
26	4	3	1010000
26	5	3	1010000
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26	9	1	1000000
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26	11	2	1100000
26	12	1	1010000
26	13	3	0011000
26	14	3	1010000
26	15	3	1010000
26	16	1	1000000
26	17	1	1010000
26	18	3	1010000
26	19	1	1010000
26	20	4	1001000
26	21	3	1111000
26	22	1	1100000
26	23	2	1100000
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26	28	3	0011000
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26	30	4	0001000
26	31	3	0011000
26	32	3	1011000
26	33	1	1010000
26	34	1	1000000
26	35	1	1000000
26	36	1	1010000
26	37	3	1011000
26	38	4	0011000
26	39	4	0011000
26	40	4	0001000
26	41	4	0011000
26	42	3	1011000
26	43	3	1010000
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26	47	1	1011000
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26	50	4	0001010
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26	54	3	1011000
26	55	3	1011000
26	56	1	1010000
26	57	1	1010000
26	58	4	1011000
26	59	1	1011010
26	60	6	0001010
26	61	6	0011010
26	62	4	0001000
26	63	4	0001000
26	64	4	0001000
26	65	4	0011000
26	66	1	1010000
26	67	1	1000000
26	68	1	1001000
26	69	4	1001000
26	70	4	0001000
26	71	4	0001000
26	72	4	0001000
26	73	4	0001000
26	74	4	0001000
26	75	4	0011000
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26	89	4	0001000
26	90	6	0001010
26	91	4	0001010
26	92	4	0001000
26	93	4	0001000
26	94	4	0001000
26	95	4	0001000
26	96	4	0001000
26	97	4	0001000
26	98	4	0001000
26	99	4	0001000
27	0	1	1000000
27	1	4	1011000
27	2	4	1011010
27	3	3	0011000
27	4	3	1011000
27	5	1	1010000
27	6	3	1010000
27	7	1	1010000

B	G	E	EVS	B	G	E	EVS	B	G	E	EVS
27	8	1	1000000	27	9	1	1000000	27	10	4	1011000
27	11	4	1011010	27	12	4	0011010	27	13	4	0011010
27	14	3	0011010	27	15	3	0011000	27	16	3	0010000
27	17	3	1010000	27	18	1	1010000	27	19	1	1010000
27	20	3	0011000	27	21	4	0011010	27	22	6	0000010
27	23	6	0010010	27	24	6	0000010	27	25	1	1011010
27	26	1	1011000	27	27	1	1010000	27	28	3	1010000
27	29	3	1010000	27	30	4	0011000	27	31	6	0011010
27	32	6	0000010	27	33	6	0001010	27	34	4	0011010
27	35	3	1011000	27	36	3	1010000	27	37	3	1010000
27	38	3	0010000	27	39	3	1010000	27	40	4	0011000
27	41	4	0011010	27	42	6	0010010	27	43	6	0010010
27	44	6	0011010	27	45	4	0011000	27	46	3	0010000
27	47	1	1010000	27	48	3	1010000	27	49	3	1010000
27	50	6	0001010	27	51	4	0011000	27	52	3	0011000
27	53	3	1010000	27	54	3	1010000	27	55	3	1010000
27	56	3	1010000	27	57	1	1010000	27	58	3	1010000
27	59	3	1010000	27	60	4	0001000	27	61	4	0001000
27	62	4	0011000	27	63	3	1010000	27	64	3	0010000
27	65	3	1010000	27	66	1	1010000	27	67	1	1010000
27	68	3	1010000	27	69	3	1010000	27	70	4	1001000
27	71	3	0011000	27	72	3	1010000	27	73	3	1010000
27	74	4	1011000	27	75	4	0011000	27	76	3	0011000
27	77	3	0010000	27	78	3	1010000	27	79	3	1010000
27	80	4	1001000	27	81	4	1011000	27	82	3	1010000
27	83	4	1011000	27	84	4	0011000	27	85	4	0011000
27	86	3	0011000	27	87	3	1010000	27	88	1	1010000
27	89	1	1010000	27	90	4	0001000	27	91	4	1011000
27	92	1	1011000	27	93	3	0010000	27	94	3	1011000
27	95	3	1011000	27	96	3	1010000	27	97	1	1010000
27	98	3	1010000	27	99	1	1000000	28	0	1	1100000
28	1	1	1100000	28	2	1	1100000	28	3	1	1100000
28	4	1	1010000	28	5	1	1010000	28	6	3	0010000
28	7	3	0010000	28	8	3	0010000	28	9	3	1010000
28	10	1	1010000	28	11	1	1010000	28	12	1	1010000
28	13	3	1010000	28	14	3	0010000	28	15	3	0010000
28	16	3	0010000	28	17	3	0010000	28	18	3	0010000
28	19	3	1010000	28	20	3	0010000	28	21	3	0010000
28	22	3	0010000	28	23	3	0010000	28	24	3	0010000
28	25	3	0010000	28	26	3	0010000	28	27	3	0010000
28	28	1	1010000	28	29	1	1000000	28	30	3	1010000
28	31	3	0010000	28	32	3	0010000	28	33	3	0010000
28	34	3	0010000	28	35	3	0010000	28	36	3	1010000
28	37	3	1010000	28	38	1	1010000	28	39	1	1000000
28	40	3	1010000	28	41	1	1010000	28	42	3	1010000
28	43	3	1010000	28	44	3	0010000	28	45	3	1010000
28	46	1	1010000	28	47	1	1010000	28	48	1	1000000
28	49	1	1000000	28	50	3	1010000	28	51	3	1010000
28	52	1	1010000	28	53	3	1010000	28	54	1	1010000
28	55	1	1010000	28	56	1	1010000	28	57	1	1000000
28	58	1	1000000	28	59	1	1000000	28	60	1	1010000
28	61	3	1010000	28	62	3	1010000	28	63	1	1010000
28	64	1	1000000	28	65	1	1000000	28	66	1	1000000
28	67	1	1000000	28	68	1	1000000	28	69	1	1000000

B	G	E	EVS
28	70	3	1010000
28	71	1	1000000
28	72	1	1000000
28	73	1	1000000
28	74	1	1000000
28	75	1	1000000
28	76	1	1000000
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28	85	1	1010000
28	86	1	1010000
28	87	3	1010000
28	88	3	1010000
28	89	3	0010000
28	90	1	1000000
28	91	1	1000000
28	92	3	1010000
28	93	1	1010000
28	94	3	1010000
28	95	3	1010000
28	96	3	1010000
28	97	3	0010000
28	98	3	0010000
28	99	3	0010000
29	0	1	1010000
29	1	1	1000000
29	2	1	1000000
29	3	1	1000000
29	4	1	1010000
29	5	3	1010000
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29	7	1	1010000
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29	9	3	0010000
29	10	1	1000000
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29	12	1	1000000
29	13	1	1000000
29	14	1	1010000
29	15	3	1010000
29	16	3	1010000
29	17	3	1010000
29	18	1	1010000
29	19	3	1010000
29	23	1	1000000
29	26	3	0010010
29	27	6	0010010
29	29	1	1010000
30	5	7	0010101
30	6	7	0000001
30	7	7	0000001
30	8	7	0000001
30	9	7	0000001
30	16	7	0010101
30	17	7	0000001
30	18	7	0000001
30	19	7	0000001
30	26	7	0010101
30	27	7	0010101
30	28	7	0000001
30	29	7	0000001
30	38	7	0010101
30	39	7	0000001
30	48	5	0010100
30	49	7	0010101
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31	78	7	0000001
31	79	7	0000001
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31	87	7	0000001
31	88	7	0000001
31	89	7	0000001
31	95	7	0000001
31	96	7	0000001
31	97	7	0000001
31	98	7	0000001
31	99	7	0000001
32	0	7	0001001
32	1	7	0000001

B	G	E	EVS	B	G	E	EVS	B	G	E	EVS
32	2	7	0000001	32	3	7	0C00001	32	4	7	0011001
32	5	7	0001001	32	6	7	0001001	32	7	4	0001001
32	8	4	0001000	32	9	4	0C01000	32	10	7	0000001
32	11	7	0000001	32	12	7	0000001	32	13	7	0C00001
32	14	7	0000001	32	15	7	0C00001	32	16	7	0000001
32	17	4	0001001	32	18	4	0001001	32	19	4	0C01001
32	20	7	0000001	32	21	7	0000001	32	22	7	0000001
32	23	7	0000001	32	24	7	0C00001	32	25	7	0001001
32	26	7	0001001	32	27	4	0001001	32	28	4	0001001
32	29	7	0000001	32	30	7	0C00001	32	31	7	0000001
32	32	7	0000001	32	33	7	0C00001	32	34	7	0C00001
32	35	7	00C0001	32	36	7	0000001	32	37	7	0011001
32	38	4	0001001	32	39	7	0C00001	32	40	7	0000001
32	41	7	0000001	32	42	7	0000001	32	43	7	0C0C001
32	44	7	0000001	32	45	7	0000001	32	46	7	0000001
32	47	7	0000001	32	48	7	0C00001	32	49	7	0C01001
32	50	7	0000001	32	51	7	0000001	32	52	7	0000001
32	53	7	0000001	32	54	7	0C00001	32	55	7	0000001
32	56	7	0000001	32	57	7	0000001	32	58	7	0CC1001
32	59	7	0001001	32	60	7	0000001	32	61	7	0000001
32	62	7	0000001	32	63	7	0C00001	32	64	7	0000001
32	65	7	0000001	32	66	7	0000001	32	67	7	0C0C001
32	68	7	0000001	32	69	7	0C00001	32	70	7	0000001
32	71	7	0000001	32	72	7	0C00001	32	73	7	0C00001
32	74	7	0000001	32	75	7	0000001	32	76	7	0000001
32	77	7	0000001	32	78	7	0C00001	32	79	7	0000001
32	80	7	0000001	32	81	7	0C00001	32	82	7	0C0C0C1
32	83	7	0C00001	32	84	7	0000001	32	85	7	0000001
32	86	7	0000001	32	87	7	0C00001	32	88	7	0000001
32	89	7	0000001	32	90	7	0000001	32	91	7	0C0C001
32	92	7	0000001	32	93	7	0C00001	32	94	7	0000001
32	95	7	0000001	32	96	7	0C00001	32	97	7	0000001
32	98	7	0000001	32	99	7	0000001	33	0	4	0001011
33	1	6	0001010	33	2	4	0C01C10	33	3	6	0001010
33	4	4	0001010	33	5	6	0001010	33	6	4	0001C10
33	7	1	1001000	33	8	4	1001000	33	9	4	0001000
33	10	7	0001001	33	11	6	0001C10	33	12	6	0001010
33	13	6	0001010	33	14	4	0001010	33	15	4	0001010
33	16	4	0001010	33	17	4	1C01C00	33	18	4	0001000
33	19	4	0001000	33	20	7	0CC1001	33	21	6	0CC1010
33	22	6	0001010	33	23	6	0001010	33	24	6	0001010
33	25	4	0001001	33	26	4	CCC1C01	33	27	4	00C1000
33	28	4	0001000	33	29	4	00C1000	33	30	7	0CC1001
33	31	4	0CC1C11	33	32	4	0C01C11	33	33	4	0001011
33	34	7	0001001	33	35	7	0C01001	33	36	7	0001001
33	37	4	0001001	33	38	4	0001000	33	39	4	0001000
33	40	4	0001001	33	41	7	CC01001	33	42	7	0000001
33	43	7	0001001	33	44	7	0001001	33	45	7	0C01001
33	46	4	0001001	33	47	4	0001000	33	48	4	0001000
33	49	4	0001000	33	50	7	0C00001	33	51	7	0000001
33	52	7	0001001	33	53	4	0001001	33	54	4	0C01001
33	55	7	0CC1001	33	56	7	0CC1001	33	57	4	0001000
33	58	4	0001000	33	59	4	0C01000	33	60	7	00C0001
33	61	7	0000001	33	62	7	0001001	33	63	7	0C01001

B	G	E	EVS
33	64	7	0001001
33	67	4	CCC1CCC
33	70	7	0000001
33	73	7	0010001
33	76	7	0000001
33	79	4	0001000
33	82	7	0011001
33	85	7	0001001
33	88	4	1001000
33	91	7	0001001
33	94	7	0011001
33	97	4	1001000
34	0	4	0001001
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34	6	4	0001000
34	9	4	1011000
34	12	4	0001000
34	15	4	0001000
34	18	1	1001000
34	21	4	0001000
34	24	4	0001000
34	27	4	1001000
34	30	4	0001000
34	33	4	0001000
34	36	4	0001000
34	39	3	1011000
34	42	4	0001000
34	45	4	1001000
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34	57	4	1001000
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34	78	4	0001000
34	81	1	1001000
34	84	1	1001000
34	87	4	0001000
34	90	4	0001000
34	93	4	0001000
34	96	4	0001000
34	99	4	0001001
35	2	4	0011000
35	5	1	1011000
35	8	6	0000010
35	11	4	0001000
35	14	4	1011000
35	17	4	0011010
35	20	4	0001000
35	23	4	1001000

B	G	E	EVS
33	65	7	0001001
33	68	4	0001000
33	71	7	0000001
33	74	7	0001001
33	77	7	0001001
33	80	7	0000001
33	83	3	0011001
33	86	7	0001001
33	89	1	1001000
33	92	7	0001001
33	95	7	0001001
33	98	1	1001001
34	1	4	0001000
34	4	4	0001000
34	7	1	1001000
34	10	4	0001000
34	13	4	0001000
34	16	4	1001000
34	19	1	1000000
34	22	4	0001000
34	25	4	0001000
34	28	1	1001000
34	31	4	0001000
34	34	4	0001000
34	37	4	1001000
34	40	4	0001000
34	43	4	0001000
34	46	1	1001000
34	49	4	0001000
34	52	4	0001000
34	55	1	1001000
34	58	4	0001000
34	61	4	1001000
34	64	4	1001001
34	67	4	0001000
34	70	1	1001000
34	73	4	0001000
34	76	4	0001000
34	79	4	0001000
34	82	4	0001000
34	85	4	0001000
34	88	4	0001000
34	91	4	0001000
34	94	4	0001001
34	97	4	0001000
35	0	1	1010000
35	3	4	0011000
35	6	4	0011010
35	9	6	0000010
35	12	4	0001000
35	15	4	1011000
35	18	6	0001010
35	21	4	0001000
35	24	4	1011000

B	G	E	EVS
33	66	7	0001001
33	69	4	0001000
33	72	7	0010001
33	75	7	0001001
33	78	4	0001000
33	81	7	0001001
33	84	3	0011001
33	87	4	0001001
33	90	7	0001001
33	93	7	0011001
33	96	4	0001001
33	99	4	1001000
34	2	4	0001000
34	5	4	0001000
34	8	4	1011000
34	11	4	0001000
34	14	4	0001000
34	17	4	1001000
34	20	4	0001000
34	23	4	0001000
34	26	4	0001000
34	29	1	1001000
34	32	4	0001000
34	35	4	0001000
34	38	1	1001000
34	41	4	0001000
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34	56	1	1001000
34	59	4	0001000
34	62	1	1001000
34	65	4	1001000
34	68	4	0001000
34	71	1	1000000
34	74	4	1001000
34	77	4	0001000
34	80	1	1001000
34	83	4	0001000
34	86	4	0001000
34	89	4	0001000
34	92	4	0001000
34	95	4	0001000
34	98	4	0001000
35	1	4	1011000
35	4	4	1011000
35	7	6	0011010
35	10	4	1011000
35	13	4	1001000
35	16	3	0011000
35	19	6	0000010
35	22	4	0001000
35	25	4	0001000

B	G	E	EVS	B	G	E	EVS	B	G	E	EVS
35	26	4	0011000	35	27	4	CC11C10	35	28	6	0001010
35	29	6	0000010	35	30	4	1C11000	35	31	4	1CC1CC0
35	32	4	C0C1000	35	33	4	1001000	35	34	4	1001000
35	35	4	0001000	35	36	4	CCC1000	35	37	4	0001000
35	38	4	0001010	35	39	4	0001010	35	40	4	0001000
35	41	4	0001000	35	42	4	CCC1000	35	43	4	1001000
35	44	4	1001000	35	45	4	CC01CC0	35	46	4	00C1CC0
35	47	4	0001000	35	48	4	0001000	35	49	4	0001000
35	50	4	0001000	35	51	4	CC01CC0	35	52	4	0001000
35	53	4	1001000	35	54	4	1001000	35	55	4	00C1CC0
35	56	4	0001CC0	35	57	4	0001000	35	58	4	0001000
35	59	4	0001000	35	60	4	CCC1CC0	35	61	4	0001000
35	62	4	1001000	35	63	4	1C01000	35	64	4	0001000
35	65	4	0001000	35	66	4	CC01000	35	67	4	0001000
35	68	4	0001000	35	69	4	CC01CC0	35	70	4	00C1CC0
35	71	4	0001000	35	72	4	0001000	35	73	4	00C1CC0
35	74	4	0001000	35	75	4	CC01010	35	76	4	0001010
35	77	6	0001010	35	78	4	0001010	35	79	4	CCC1CC0
35	80	4	C0C1000	35	81	4	0001000	35	82	4	0001000
35	83	4	0001010	35	84	4	C001010	35	85	6	CC01010
35	86	6	0001010	35	87	6	0001010	35	88	6	0001010
35	89	4	0001000	35	90	4	CCC1000	35	91	4	0001000
35	92	6	0001010	35	93	6	CC01010	35	94	6	CCC1010
35	95	6	C0C1010	35	96	6	0000010	35	97	6	0001010
35	98	6	0001010	35	99	4	CC01C10	36	C	6	0CC0010
36	1	6	0000010	36	2	6	0001010	36	3	4	0001010
36	4	4	CCC1000	36	5	4	CC01000	36	6	4	0001000
36	7	4	0001000	36	8	4	CCC1CC0	36	9	4	0011000
36	10	6	0000010	36	11	6	0000010	36	12	6	0000010
36	13	6	0001010	36	14	4	CCC1000	36	15	4	0001000
36	16	4	0001000	36	17	4	0001000	36	18	4	00C1CC0
36	19	3	1C11000	36	20	6	0000010	36	21	6	0000010
36	22	4	00C1010	36	23	6	0CC1C10	36	24	4	00C1000
36	25	4	00C1000	36	26	4	1001000	36	27	4	1CC1CC0
36	28	4	1CC1CC0	36	29	3	1C10000	36	30	4	0001010
36	31	6	0001010	36	32	6	0001010	36	33	4	1001010
36	34	4	1001000	36	35	4	1001000	36	36	4	1011000
36	37	4	1011000	36	38	1	1C11000	36	39	3	1011000
36	40	4	0001000	36	41	4	0001000	36	42	4	00C1CCC
36	43	4	1CC1000	36	44	4	1001000	36	45	1	1011000
36	46	3	1011000	36	47	3	1C110CC	36	48	4	1011000
36	49	1	1010000	36	50	4	0001000	36	51	4	0001CC0
36	52	4	0001000	36	53	4	CCC1000	36	54	4	1CC1CC0
36	55	4	1011000	36	56	3	1C10CCC	36	57	3	1C10CCC
36	58	3	1010000	36	59	1	1010000	36	60	4	00010C0
36	61	4	0001000	36	62	4	CCC1CC0	36	63	4	0CC1000
36	64	4	1001000	36	65	1	1011000	36	66	1	1010CCC
36	67	1	1C10000	36	68	1	1C01000	36	69	4	1C11000
36	70	4	0001000	36	71	4	CC01CC0	36	72	4	1001000
36	73	1	1001000	36	74	1	1C11000	36	75	1	1010000
36	76	1	1011000	36	77	4	CCC1C00	36	78	4	0011000
36	79	4	0011000	36	80	4	0001000	36	81	4	1C010C0
36	82	4	1CC1000	36	83	1	1C01000	36	84	1	1011000
36	85	1	1011000	36	86	3	1C110CC	36	87	1	1011000

B	G	E	EVS
36	88	1	1C11000
36	91	4	1001000
36	94	4	0001000
36	97	4	0011000
37	0	4	0011000
37	3	1	1C1CCCC
37	6	1	1000000
37	9	1	1010000
37	12	3	1C1C000
37	15	4	1001000
37	18	4	1011000
37	21	1	1000000
37	24	1	1000000
37	27	4	0011000
37	30	3	1C10000
37	33	4	1001000
37	36	4	0011000
37	39	3	1010000
37	42	4	1001000
37	45	4	1011000
37	48	1	1010000
37	51	3	0011000
37	54	4	1001000
37	57	3	1010000
37	60	3	1011000
37	63	1	1011000
37	66	1	1000000
37	69	1	1000000
37	72	1	1011000
37	75	1	1010000
37	78	3	1010000
37	81	1	1010000
37	84	1	1011000
37	87	3	1010000
37	90	4	1011000
37	93	1	1011000
37	96	3	0011000
37	99	3	1010000
38	2	1	1010000
38	5	3	0010000
38	8	3	0010000
38	11	1	1010000
38	14	3	0010000
38	17	3	0010000
38	20	1	1010000
38	23	1	1010000
38	26	1	1010000
38	29	3	0010000
38	32	3	1010000
38	35	3	1010000
38	38	3	1010000
38	41	3	1010000
38	44	1	1010000
38	47	1	1010000

B	G	E	EVS
36	89	4	1011000
36	92	1	1001000
36	95	4	0001000
36	98	4	0001000
37	1	3	0011000
37	4	1	1010000
37	7	1	1000000
37	10	3	1010000
37	13	1	1010000
37	16	1	1001000
37	19	1	1011000
37	22	1	1010000
37	25	1	1001000
37	28	3	1011000
37	31	1	1010000
37	34	1	1001000
37	37	3	1011000
37	40	1	1010000
37	43	4	1001000
37	46	3	1011000
37	49	3	1010000
37	52	1	1011000
37	55	1	1011000
37	58	3	1010000
37	61	3	1011000
37	64	1	1011000
37	67	1	1000000
37	70	3	1010000
37	73	1	1001000
37	76	1	1000000
37	79	1	1011000
37	82	1	1011000
37	85	1	1011000
37	88	1	1010000
37	91	1	1011000
37	94	4	1001000
37	97	3	1010000
38	0	3	1010000
38	3	1	1010000
38	6	3	0010000
38	9	3	0010000
38	12	3	1010000
38	15	3	0010000
38	18	3	0010000
38	21	1	1010000
38	24	1	1010000
38	27	3	0010000
38	30	1	1010000
38	33	1	1010000
38	36	3	0010000
38	39	3	1010000
38	42	1	1010000
38	45	3	1010000
38	48	1	1010000

B	G	E	EVS
36	90	4	0001000
36	93	1	1001000
36	96	4	0011000
36	99	4	0001000
37	2	3	1010000
37	5	1	1000000
37	8	1	1010000
37	11	1	1010000
37	14	1	1000000
37	17	4	1001000
37	20	1	1010000
37	23	1	1010000
37	26	4	1001000
37	29	3	1011000
37	32	3	1011000
37	35	4	1001000
37	38	1	1010000
37	41	1	1011000
37	44	4	1011000
37	47	3	1010000
37	50	4	1011000
37	53	4	1001000
37	56	1	1010000
37	59	1	1010000
37	62	4	1001000
37	65	1	1010000
37	68	1	1000000
37	71	1	1010000
37	74	3	1010000
37	77	1	1010000
37	80	3	1011000
37	83	1	1010000
37	86	1	1000000
37	89	3	1011000
37	92	1	1011000
37	95	3	0011000
37	98	3	1010000
38	1	1	1010000
38	4	3	0010000
38	7	3	0010000
38	10	3	1010000
38	13	1	1010000
38	16	3	1010000
38	19	3	0010000
38	22	1	1010000
38	25	3	0010000
38	28	3	0010000
38	31	3	1010000
38	34	3	1010000
38	37	3	0010000
38	40	1	1010000
38	43	1	1010000
38	46	3	1010000
38	49	3	1010000

B	G	E	EVS
38	50	1	1010000
38	53	1	1010000
38	56	3	1011000
38	59	4	0011000
38	62	3	1010000
38	65	4	0011000
38	68	4	0011000
38	71	1	1001000
38	74	4	0001000
38	77	4	0001000
38	80	4	0001000
38	83	4	0001000
38	86	4	0001000
38	89	4	0001000
38	92	4	1001000
38	95	4	0001000
38	98	4	0001000
41	8	7	0000001
41	19	7	0000001
41	88	4	1001000
41	97	4	0001000
42	0	7	0000001
42	3	7	0000001
42	6	7	0000001
42	9	7	0000001
42	13	7	0000001
42	16	7	0000001
42	19	7	0000001
42	25	7	0000001
42	28	7	0000001
42	35	7	0000001
42	38	7	0010001
42	44	4	0001000
42	47	4	0001001
42	55	4	0001000
42	58	4	1101000
42	63	4	0001000
42	66	4	1001000
42	69	1	1101000
42	73	4	1001000
42	76	4	1001000
42	79	4	0001000
42	82	4	1001000
42	85	4	1001000
42	88	4	0001000
42	91	4	0001000
42	94	4	1001000
42	97	4	0001000
43	0	7	0000001
43	3	4	0011001
43	6	4	1001000
43	9	4	0001000
43	12	7	0011001
43	15	1	1100000

B	G	E	EVS
38	51	1	1010000
38	54	1	1010000
38	57	4	1011000
38	60	1	1010000
38	63	3	1011000
38	66	4	0011000
38	69	4	0001000
38	72	1	1001000
38	75	4	0001000
38	78	4	0001000
38	81	4	1001000
38	84	4	0001000
38	87	4	0001000
38	90	4	1011000
38	93	4	1001000
38	96	4	0001000
38	99	4	0001000
41	9	7	0000001
41	78	4	0001000
41	95	4	0001000
41	98	4	1001000
42	1	7	0000001
42	4	7	0000001
42	7	7	0000001
42	10	7	0000001
42	14	7	0000001
42	17	7	0000001
42	23	7	0000001
42	26	7	0000001
42	29	7	0000001
42	36	7	0000001
42	39	7	0001001
42	45	4	0001001
42	48	4	0011001
42	56	4	1001000
42	59	4	0101000
42	64	4	0001000
42	67	4	1001000
42	71	4	1001000
42	74	4	1001000
42	77	1	1001000
42	80	4	0001000
42	83	4	1001000
42	86	4	0001000
42	89	4	0001000
42	92	4	1001000
42	95	4	0001000
42	98	4	0001000
43	1	7	0001001
43	4	4	0001001
43	7	1	1001000
43	10	7	0010001
43	13	4	1001000
43	16	1	1000000

B	G	E	EVS
38	52	1	1010000
38	55	1	1010000
38	58	4	0011000
38	61	3	1010000
38	64	4	0011000
38	67	4	0001000
38	70	4	1001000
38	73	4	0001000
38	76	4	0001000
38	79	4	0001000
38	82	1	1001000
38	85	4	0001000
38	88	4	0001000
38	91	4	0001000
38	94	4	0001000
38	97	4	0001000
41	7	7	0000101
41	18	5	0000101
41	87	4	1001000
41	96	4	0001000
41	99	4	1001000
42	2	7	0000001
42	5	7	0000001
42	8	7	0000001
42	12	7	0000001
42	15	7	0000001
42	18	7	0000001
42	24	7	0000001
42	27	7	0000001
42	33	7	0000001
42	37	7	0000001
42	43	4	0001000
42	46	7	0001001
42	49	3	0011001
42	57	1	1101000
42	62	4	0001000
42	65	4	1001000
42	68	4	1101000
42	72	4	1001000
42	75	1	1001000
42	78	4	0001000
42	81	4	0001000
42	84	1	1001000
42	87	4	0001000
42	90	4	0001000
42	93	1	1001000
42	96	4	0001000
42	99	4	0001000
43	2	7	0010001
43	5	4	1001001
43	8	1	1001000
43	11	7	0010001
43	14	1	1101000
43	17	4	1001000

B	G	E	EVS
43	18	4	0001000
43	21	7	CC10001
43	24	1	1101000
43	27	4	0001000
43	30	7	CC10001
43	33	4	1101000
43	36	4	0001010
43	39	4	0001000
43	42	4	0101001
43	45	6	0001010
43	48	4	0001000
43	51	2	1101000
43	54	6	0001010
43	57	4	0001000
43	60	4	1001000
43	63	4	0001000
43	66	4	0001000
43	69	4	0001000
43	72	6	0001010
43	75	4	0001000
43	78	4	0001100
43	81	6	0001010
43	84	4	0001000
43	90	4	0001010
43	93	4	0001000
44	0	4	0001001
44	3	4	0001000
44	6	4	0001000
44	9	4	0001000
44	12	4	0001001
44	15	4	0001000
44	18	4	0001001
44	21	7	0000001
44	24	7	0001001
44	27	4	0001001
44	30	4	0001000
44	33	4	0001001
44	36	7	0000001
44	39	4	0001011
44	42	7	0001001
44	45	7	0001001
44	48	7	0000001
44	51	7	0001001
44	54	4	0001001
44	57	7	0000001
44	60	4	0001000
44	63	4	0001001
44	66	7	0001001
44	69	4	0001001
44	72	5	0001101
44	75	7	0001001
44	78	7	0000001
44	87	7	0001101
44	98	7	0001101

B	G	E	EVS
43	19	4	0001000
43	22	4	0011001
43	25	4	1001000
43	28	4	0001000
43	31	7	0010001
43	34	4	1101000
43	37	4	0001000
43	40	7	0011001
43	43	1	1101000
43	46	4	0001000
43	49	4	0001000
43	52	4	1101000
43	55	6	0001010
43	58	4	0001000
43	61	4	1001010
43	64	6	0001010
43	67	4	0001000
43	70	4	0001000
43	73	4	0001010
43	76	4	0001000
43	79	4	0001100
43	82	4	0001010
43	85	4	0001000
43	91	4	0001010
43	94	4	0001100
44	1	4	0001000
44	4	4	0001000
44	7	4	0001000
44	10	7	0001001
44	13	7	0001001
44	16	4	0001000
44	19	4	0001001
44	22	7	0001001
44	25	7	0001001
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44	31	4	0001001
44	34	7	0001001
44	37	7	0000001
44	40	4	0001000
44	43	4	0001001
44	46	7	0000001
44	49	7	0001001
44	52	7	0001001
44	55	7	0001001
44	58	7	0000001
44	61	4	0001001
44	64	7	0001001
44	67	7	0000001
44	70	5	0001100
44	73	7	0001101
44	76	7	0001001
44	79	4	0001001
44	88	7	0001001
44	99	7	0001001

B	G	E	EVS
43	20	7	0000001
43	23	4	1001000
43	26	1	1001000
43	29	4	0001000
43	32	7	0001001
43	35	4	0001010
43	38	4	0001000
43	41	7	0001001
43	44	6	1001010
43	47	4	0001000
43	50	2	1101000
43	53	4	1001000
43	56	6	0001010
43	59	4	0001000
43	62	4	0001010
43	65	4	0001010
43	68	4	0001000
43	71	4	0001010
43	74	4	0001000
43	77	4	0001000
43	80	4	0001010
43	83	4	0001000
43	86	4	0001100
43	92	6	0001010
43	95	5	0001100
44	2	4	0001000
44	5	4	0001000
44	8	4	0001000
44	11	7	0001001
44	14	7	0001001
44	17	4	0001001
44	20	7	0000001
44	23	4	0001001
44	26	7	0001001
44	29	7	0001001
44	32	4	0001001
44	35	7	0001001
44	38	7	0000001
44	41	4	0001001
44	44	7	0001001
44	47	7	0000001
44	50	4	0001000
44	53	4	0001001
44	56	7	0001001
44	59	7	0001001
44	62	4	0001001
44	65	4	0001001
44	68	7	0000001
44	71	4	0001100
44	74	7	0001101
44	77	7	0000001
44	86	5	0001101
44	89	4	0001001
45	0	4	0001000

B	G	E	EVS
45	1	4	0011000
45	4	3	0010010
45	7	3	0010010
45	10	4	0001000
45	13	4	0011000
45	16	3	0010010
45	19	3	1010000
45	22	7	0001001
45	25	1	1001000
45	28	3	1010000
45	31	4	0001010
45	34	4	1001000
45	37	3	1010000
45	40	4	0001010
45	43	7	0001001
45	46	3	0011000
45	49	3	1011000
45	52	4	0001000
45	55	4	0001000
45	58	4	0001000
45	61	7	0001001
45	64	4	0001000
45	67	4	0001000
45	70	7	0001001
45	73	4	0001000
45	76	4	0001000
45	79	1	1001000
45	82	7	0001001
45	85	4	0001000
45	88	4	1001000
45	91	4	0001001
45	94	4	0001000
45	97	4	0001000
46	0	4	1001000
46	3	4	1001000
46	6	4	0001000
46	9	4	1001000
46	12	1	1001000
46	15	4	0001000
46	18	4	1001000
46	21	4	1001000
46	24	4	0001000
46	27	4	0001000
46	30	4	1001000
46	33	4	0001000
46	36	4	0001000
46	39	4	1001000
46	42	4	0001000
46	45	4	1001000
46	48	4	0001000
46	51	4	0001000
46	54	4	0001000
46	57	4	0001000
46	60	4	1001000

B	G	E	EVS
45	2	3	0011000
45	5	6	0010010
45	8	3	0010000
45	11	4	0001000
45	14	6	0011010
45	17	3	0010000
45	20	4	0001000
45	23	4	0001001
45	26	3	0010000
45	29	3	0010000
45	32	7	0001011
45	35	4	1011000
45	38	3	1010000
45	41	6	0001011
45	44	4	0001001
45	47	3	0010000
45	50	4	0001000
45	53	4	0001000
45	56	4	0001000
45	59	4	1001000
45	62	4	0001000
45	65	4	0001000
45	68	4	0001000
45	71	7	0001001
45	74	4	0001000
45	77	4	0001000
45	80	7	0001001
45	83	7	0001001
45	86	4	0001000
45	89	4	1001000
45	92	7	0001001
45	95	4	0001000
45	98	4	1001000
46	1	4	1001000
46	4	4	0001000
46	7	4	0001000
46	10	1	1001000
46	13	4	0001000
46	16	4	0001000
46	19	1	1001000
46	22	4	1001000
46	25	4	0001000
46	28	4	1001000
46	31	1	1001000
46	34	4	0001000
46	37	1	1001000
46	40	4	1001000
46	43	4	0001000
46	46	4	1001000
46	49	4	1001000
46	52	4	0001000
46	55	4	1001000
46	58	4	0001000
46	61	4	0001000

B	G	E	EVS
45	3	3	0011000
45	6	6	0010010
45	9	3	0010000
45	12	4	0001000
45	15	3	0010010
45	18	3	0010000
45	21	4	0001000
45	24	3	1011000
45	27	3	1010000
45	30	6	0001010
45	33	4	0001001
45	36	3	1010000
45	39	3	1011000
45	42	7	0001001
45	45	4	0001001
45	48	3	1010000
45	51	4	0001000
45	54	4	0001000
45	57	4	0001000
45	60	7	0001001
45	63	4	0001000
45	66	4	0001000
45	69	4	1001000
45	72	4	0001001
45	75	4	0001000
45	78	4	0001000
45	81	4	0001001
45	84	4	0001001
45	87	4	0001000
45	90	7	0001001
45	93	7	0001001
45	96	4	0001000
45	99	4	1001000
46	2	4	1001000
46	5	4	0001000
46	8	4	0001000
46	11	4	1001000
46	14	4	0001000
46	17	4	0001000
46	20	4	1001000
46	23	4	0001000
46	26	4	0001000
46	29	4	0001000
46	32	4	0001000
46	35	4	0001000
46	38	4	1001000
46	41	4	1001000
46	44	4	0001000
46	47	4	1001000
46	50	4	1001000
46	53	4	0001000
46	56	4	0001000
46	59	4	0001000
46	62	4	0001000

B	G	E	EVS
46	63	4	0CC1000
46	64	4	0C01000
46	65	4	0001000
46	66	4	0001000
46	67	6	0001010
46	68	4	0001010
46	69	4	0001000
46	70	4	0001000
46	71	4	0001000
46	72	4	0001000
46	73	4	0C01000
46	74	4	0001000
46	75	4	0001010
46	76	4	0001010
46	77	6	0001010
46	78	4	0CC1010
46	79	4	0001000
46	80	4	0001000
46	81	4	0001000
46	82	4	0C01C01
46	83	4	0001001
46	84	4	0001001
46	85	4	0001010
46	86	6	0001010
46	87	6	CCCC010
46	88	6	0001010
46	89	7	0001001
46	90	4	0001010
46	91	4	0001010
46	92	4	0001001
46	93	7	0C01001
46	94	7	0001001
46	95	4	0001001
46	96	6	0001010
46	97	6	CC01011
46	98	7	0001011
46	99	7	0000001
47	0	1	1011000
47	1	1	1001000
47	2	1	1CCC000
47	3	4	1001000
47	4	4	0001000
47	5	4	1001000
47	6	4	0C11000
47	7	3	1011000
47	8	3	1010000
47	9	3	1010000
47	10	1	1001000
47	11	4	1001000
47	12	4	1C01000
47	13	1	1001000
47	14	4	0001000
47	15	4	CC01000
47	16	4	0001000
47	17	4	0C11000
47	18	3	1010000
47	19	3	1010000
47	20	4	10C1000
47	21	4	0CC1000
47	22	1	1001000
47	23	4	1001000
47	24	4	0001000
47	25	4	00C10C0
47	26	4	00C1010
47	27	4	1001010
47	28	3	1010000
47	29	3	1010000
47	30	4	0C01000
47	31	4	0C01000
47	32	4	1001000
47	33	4	1001000
47	34	4	1001000
47	35	4	0001010
47	36	6	0001010
47	37	4	1001010
47	38	3	1011000
47	39	3	0C11000
47	40	4	0CC1000
47	41	4	CCC1000
47	42	4	0001000
47	43	4	1001000
47	44	1	1001000
47	45	4	CC01010
47	46	6	0001010
47	47	4	0001000
47	48	1	1001000
47	49	3	0011000
47	50	4	0001000
47	51	4	0001000
47	52	4	0001000
47	53	4	1001000
47	54	4	1C01000
47	55	4	1001000
47	56	4	0001010
47	57	4	1001010
47	58	1	1001000
47	59	1	1001000
47	60	4	0C01000
47	61	4	0001000
47	62	4	0001000
47	63	4	0C01000
47	64	4	1001000
47	65	1	1001000
47	66	6	0001010
47	67	4	1001010
47	68	4	1001000
47	69	4	1C01000
47	70	4	0001000
47	71	4	0001000
47	72	4	0001000
47	73	4	0CC1000
47	74	4	0CC1000
47	75	4	1C01000
47	76	4	1001010
47	77	4	1001000
47	78	1	1C01000
47	79	4	0001000
47	80	7	0001001
47	81	4	0001001
47	82	4	0001001
47	83	4	0001001
47	84	4	CC01001
47	85	7	1001001
47	86	4	1001000
47	87	4	0C01000
47	88	4	1001000
47	89	4	CCC10C0
47	95	4	1001000
47	96	4	1001000
47	97	4	0001000
47	98	4	1C01C00
47	99	4	0001000
47	90	7	0000001
47	91	7	0000001
47	92	7	0000001
47	93	7	CCC1001
47	94	4	0C01000
48	0	3	1011000
48	1	4	0001000
48	2	4	0001000
48	3	4	1C01000
48	4	4	0001000
48	5	4	0001000
48	6	4	0001000
48	7	4	0001000
48	8	4	CC01C00
48	9	4	0001000
48	10	4	1011000
48	11	4	1001000
48	12	1	1001000
48	13	4	1CC10C0
48	14	4	0C01000
48	15	4	0001000
48	16	4	0001000
48	17	4	0CC10C0
48	18	4	0001000
48	19	4	0001000
48	20	1	1011000
48	21	4	00C10C0
48	22	4	10C10C0
48	23	1	1001000
48	24	4	1C01000

B	G	E	EVS	B	G	E	EVS	B	G	E	EVS
48	25	4	1001000	48	26	4	0001000	48	27	4	0001000
48	28	4	0001000	48	29	4	0001000	48	30	4	1011000
48	31	4	1001000	48	32	4	1001000	48	33	4	0001010
48	34	6	0001010	48	35	4	1001010	48	36	4	1001000
48	37	1	1001000	48	38	4	0001000	48	39	4	0001000
48	40	4	0001000	48	41	4	1001000	48	42	4	1001000
48	43	4	1001010	48	44	4	1001010	48	45	4	0001010
48	46	4	0001010	48	47	4	1001000	48	48	4	1001000
48	49	4	0001000	48	50	4	0001000	48	51	4	0001000
48	52	4	1001000	48	53	4	1001000	48	54	4	1001000
48	55	4	1001000	48	56	4	0001000	48	57	4	0001000
48	58	4	0001000	48	59	4	0001000	48	60	4	1001000
48	61	4	0001000	48	62	4	0001000	48	63	4	1001000
48	64	4	1001000	48	65	4	0001000	48	66	4	0001000
48	67	4	0001010	48	68	4	0001010	48	69	4	0001010
48	70	4	1001000	48	71	4	0001000	48	72	4	0001000
48	73	4	0001000	48	74	4	1001000	48	75	4	1001000
48	76	4	0001010	48	77	6	0001010	48	78	6	0000010
48	79	6	0000010	48	80	4	0001000	48	81	4	0001000
48	82	4	0001000	48	83	4	0001000	48	84	4	0001000
48	85	1	1001000	48	86	4	1001000	48	87	6	0001010
48	88	6	0000010	48	89	6	0000010	48	90	4	0001000
48	91	4	0001000	48	92	4	0001000	48	93	4	0001000
48	94	4	0001000	48	95	4	0001010	48	96	6	0001010
48	97	6	0001010	48	98	6	0001010	48	99	6	0000010
51	5	4	0001000	51	6	4	0001000	51	7	4	0001000
51	8	4	0001000	51	9	4	0001000	51	11	1	1001000
51	12	4	0001000	51	15	4	0001000	51	16	4	0001000
51	17	4	0001000	51	18	4	0001000	51	19	4	1001000
51	21	1	1001000	51	23	4	1001000	51	24	1	1001000
51	25	4	1001000	51	26	4	0001000	51	27	4	0001000
51	28	4	0001000	51	29	4	1001000	51	32	4	0001000
51	33	4	0001000	51	34	4	1001000	51	35	1	1001000
51	36	1	1001000	51	37	1	1001000	51	38	4	1001000
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51	44	1	1001000	51	45	4	1001000	51	46	4	1001000
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51	52	4	1001000	51	54	4	0001000	51	55	4	0001000
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51	59	4	1001000	51	62	5	1001100	51	65	4	0001000
51	66	4	0001000	51	67	4	0001000	51	68	4	0001000
51	76	4	0001000	51	77	4	0001000	51	87	4	1001000
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52	9	4	0001000	52	10	4	1001000	52	11	1	1001000
52	12	4	1001000	52	13	1	1001000	52	14	4	0001000
52	15	4	0001000	52	16	4	0001000	52	17	4	0001000
52	18	4	0001000	52	19	4	0001100	52	20	1	1001000
52	21	4	1001000	52	22	4	0001000	52	23	4	0001000
52	24	4	0001000	52	25	4	0001000	52	26	4	0001000
52	27	4	0001000	52	30	1	1001000	52	31	4	0001000
52	32	4	0001000	52	33	4	0001000	52	34	4	0001000
52	35	4	0001000	52	36	4	0001000	52	37	4	0001000

B	G	E	EVS	B	G	E	EVS	B	G	E	EVS
52	40	1	1001000	52	41	4	0001000	52	42	4	0001000
52	43	4	0001000	52	44	4	0001000	52	45	4	0001000
52	46	4	0001000	52	50	1	1001000	52	51	4	1001000
52	52	4	0001000	52	53	4	0001000	52	54	4	0001000
52	55	4	0001000	52	60	4	0001000	52	61	4	0001000
52	62	4	0001000	52	63	4	0001000	52	64	4	0001000
52	72	4	0001000	52	73	4	0001000	52	82	5	0001100
53	0	4	0001100	53	3	5	0001100	54	9	4	0001100
55	0	4	0001101	55	1	7	0001001	55	2	7	0000001
55	3	7	0001001	55	4	4	0001001	55	5	4	0001000
55	6	4	0001000	55	7	4	0001000	55	8	1	1001000
55	9	4	0001000	55	11	4	0001101	55	12	7	0001001
55	13	4	0001000	55	14	4	0001000	55	15	4	0001000
55	16	4	0001000	55	17	4	0001000	55	18	1	1001000
55	19	1	1001000	55	22	7	0001101	55	23	4	0001000
55	24	4	0001000	55	25	4	0001000	55	26	4	0001000
55	27	4	1001000	55	28	4	1001000	55	29	4	1001000
55	33	4	0001100	55	34	4	0001100	55	35	5	0001100
55	36	4	1001100	55	37	1	1001100	55	38	4	0001000
55	39	4	0001000	55	45	4	0001100	55	46	4	1001000
55	47	4	1001000	55	48	4	0001000	55	49	4	0001001
55	56	4	0001100	55	57	4	0001100	55	58	4	0001000
55	59	4	0001001	55	68	4	0001100	55	69	7	0001101
56	0	6	0001010	56	1	4	0001011	56	2	4	0001001
56	3	7	0000001	56	4	7	0000001	56	5	4	0001001
56	6	4	0001001	56	7	6	0001010	56	8	7	0001001
56	9	7	0000001	56	10	4	0001001	56	11	7	0001001
56	12	7	0000001	56	13	7	0001001	56	14	7	0001001
56	15	7	0001001	56	16	4	0001011	56	17	7	0001011
56	18	7	0001011	56	19	7	0001001	56	20	4	0001000
56	21	7	0001001	56	22	7	0000001	56	23	7	0001001
56	24	7	0001001	56	25	7	0001001	56	26	7	0001001
56	27	7	0001001	56	28	7	0000001	56	29	7	0001001
56	30	4	0001000	56	31	4	0001001	56	32	7	0001001
56	33	7	0001001	56	34	7	0001001	56	35	7	0000001
56	36	7	0000001	56	37	7	0000001	56	38	7	0000001
56	39	7	0001001	56	40	7	0001001	56	41	7	0001001
56	42	7	0000001	56	43	7	0010001	56	44	7	0010001
56	45	7	0000001	56	46	7	0000001	56	47	7	0000001
56	48	7	0001001	56	49	7	0001001	56	50	7	0000001
56	51	7	0000001	56	52	7	0000001	56	53	7	0010001
56	54	3	0010001	56	55	3	0010001	56	56	7	0010001
56	57	7	0000001	56	58	7	0000001	56	59	7	0000001
56	60	7	0001101	56	61	7	0001001	56	62	7	0001001
56	63	7	0001001	56	64	7	0001001	56	65	7	0000001
56	66	7	0010001	56	67	3	0010001	56	68	7	0000001
56	69	7	0001001	56	73	7	0000101	56	74	7	0000101
56	75	7	0000001	56	76	7	0010101	56	77	3	0010101
56	78	5	0010101	56	79	5	0010100	57	0	7	0000001
57	1	7	0001001	57	2	7	0001001	57	3	4	0001001
57	4	4	0001000	57	5	4	0001000	57	6	4	0001010
57	7	4	0001000	57	8	4	0001000	57	9	4	0001000
57	10	7	0001001	57	11	7	0001001	57	12	4	0001001
57	13	4	0001001	57	14	4	0001001	57	15	4	0001001

B	G	E	EVS
57	16	4	0001000
57	19	4	0001000
57	22	7	0001001
57	25	7	0001001
57	28	4	0001000
57	31	7	0000001
57	34	7	0000001
57	37	4	0001000
57	40	7	0000001
57	43	7	0000001
57	46	4	0001001
57	49	4	0001001
57	52	7	0000001
57	55	4	0001001
57	58	4	0001001
57	61	7	0000001
57	64	7	0001101
57	67	7	0001001
57	76	7	0001101
57	79	7	0001001
58	2	4	0001000
58	5	4	0001010
58	8	6	0000010
58	11	4	0001000
58	14	4	0001000
58	17	4	0001010
58	20	4	0001000
58	23	4	0001000
58	26	4	0001000
58	29	4	0001001
58	32	4	0001000
58	35	4	0001000
58	38	7	0001001
58	41	4	0001000
58	44	4	0001000
58	47	7	0001001
58	50	7	0001001
58	53	4	0001010
58	56	7	0000001
58	59	7	0000001
58	62	4	0001011
58	65	7	0000001
58	68	7	0000001
58	71	7	0001001
58	74	7	0001001
58	77	7	0001101
58	82	5	0001101

B	G	E	EVS
57	17	4	0001000
57	20	7	0000001
57	23	7	0000001
57	26	4	0001000
57	29	4	0001000
57	32	7	0000001
57	35	7	0001001
57	38	4	0001000
57	41	7	0000001
57	44	7	0000001
57	47	4	0001001
57	50	7	0000001
57	53	7	0000001
57	56	7	0001001
57	59	7	0001001
57	62	7	0000001
57	65	7	0001001
57	68	7	0001001
57	77	7	0001101
58	0	4	0001000
58	3	4	0001000
58	6	6	0000010
58	9	6	0000010
58	12	4	0001000
58	15	4	0001010
58	18	6	0001010
58	21	4	0001000
58	24	4	0001000
58	27	4	0001000
58	30	4	0001000
58	33	4	0001000
58	36	4	0001000
58	39	7	0000001
58	42	4	0001000
58	45	4	0001001
58	48	7	0000001
58	51	4	0001001
58	54	4	0001001
58	57	7	0000001
58	60	7	0000001
58	63	4	0001010
58	66	7	0000001
58	69	7	0000001
58	72	7	0001001
58	75	7	0000001
58	78	4	0001101
58	83	4	0001001

B	G	E	EVS
57	18	4	0001000
57	21	7	0000001
57	24	7	0001001
57	27	4	0001000
57	30	7	0000001
57	33	7	0000001
57	36	4	0001000
57	39	4	0001000
57	42	7	0000001
57	45	7	0001001
57	48	4	0001001
57	51	7	0000001
57	54	7	0000001
57	57	7	0001001
57	60	7	0010101
57	63	7	0001101
57	66	7	0000001
57	69	7	0001001
57	78	7	0001101
58	1	4	0001000
58	4	4	0001000
58	7	6	0000010
58	10	4	0001000
58	13	4	0001000
58	16	6	0001010
58	19	4	0001010
58	22	4	0001000
58	25	4	0001000
58	28	4	0001001
58	31	4	0001000
58	34	4	0001000
58	37	4	0001001
58	40	4	0001000
58	43	4	0001000
58	46	4	0001001
58	49	7	0000001
58	52	6	0001010
58	55	7	0001001
58	58	7	0000001
58	61	7	0001001
58	64	7	0001011
58	67	7	0000001
58	70	7	0001001
58	73	7	0001001
58	76	7	0001001
58	79	4	0001101

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13. ABSTRACT

A ten percent random sample of map data is judged adequate to reproduce the first order spatial characteristics of the distribution pattern for the seven major types of depositional environments in the Mississippi Delta region of Southeast Louisiana. This conclusion is based on; 1)dendrographs which portray interdistance relationships among mean coordinate locations for the different environments, 2) the sampling properties of the Goodman-Kruskal measure of cross association as it is applied to nearest unlike neighbor samples, and 3)proximal maps which are reconstructions of the original pattern based on sample data.

In analyzing map patterns, principal component analysis can be used to depict spatial trends. Within the Mississippi Delta region, the natural levee, point bar, bay-sound, and beach environments show a marked linear trend whereas the swamp, lacustrine, and marsh environments are more isotropic. With respect to location, the lacustrine environment is situated in an intermediate position between nonmarine and marine depositional environments.

The total sample of 4025 data points taken from the environment distribution map of the Mississippi Delta region on which this study is based is contained in the Appendix.

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