UTILIZATION OF THE COMPUTERIZED MAPPING IN ECOLOGICAL RESEARCH

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In order to develop the technology in ecological mapping in China, a number of ecological maps has been generated by computer for Xizang Autonomous Region (Tibet).

The following operations were used for compiling the computerized maps :

1 - Preparation of the base map.

A 1: 6 000,000 map of Tibet was used as the base map. The base map consists of outline of Autonomous Region and data sites. The location of the outline and data sites was converted to map coordinates internally. Each interveneing pring position have its value interrupted according to a special "triangle projective method".

2 - Preparation of the basic ecological factor maps.

The mean annual temperature map, the average precipitation map and the relative humidity map have been compiled. There are only 30 data sites with long term meteorological records. In addition to these, a large number of suplement data was used according to a mathematical model, which shows the correlation between mean annual temperature and geographical positions in Tibet :

$$T=-11.5+1.9x-0.0122x^2+0.312y-0.0345xy+0.000212x^2y.$$
$$+110.59\left(\frac{1}{y-20}\right)-3.75\left(\frac{x}{y-20}\right)+0.022\left(\frac{x}{y-20}\right)$$

r= 0.98
T :- Mean annual temperature in °C at the ideal sea level;
y : degree of latitude;
r : coefficiency of correlation.

3 - Estimate the primary productivity.

Primary productivity was simulated by the fomulas cited from Miami Model.

$$NPP\ (t) = \frac{3000}{1+e^{(1.315+0.119t)}}$$

$$NPP\ (np) = 3000\ (1-e^{-0.000664p})$$

Where NPP(t) and NPP(np)=annual total net primary productivity in g/m2.

t= mean annual temperature in °C,
p= average annual precipitation in mm,
e= base of natural logarithms.

Two productivity values estimated separatly. According to Liebig's low of the minimum, the lower of the two predicted productivity values was chosen as the productivity value.

4 - Potential vegetation map.

In order to compile the potential vegetation map, the following pattern of distribution of vegetation in relation to the hydro-thermal index was used :

5 - Map printing process :

On the purpose of improve the quality of the printed map we used the separated printing method to get the qualified colour map instead of the once printing to get the white-black map with different signal of overprint.

DISCUSSION

In general, the attempt of utilization of computerized technology for study the productivity and potential distribution of vegetation has got successful results.But there are two points in our map waiting further improvement: 1.The number of data sites is not enough as comparison with the vast area of Tibet. 2. The using of formulas of Miami Model for estimating the productivity of Tibet has to be tested in the future.

Four colour maps of Tibet, scale

1/12 000 000,were attached to the paper.

The Vegetation Map of China, scale 1/4 000 000, published in Peking during 1979 was presented. This map includes 89 colours for natural vegetation, 24 for cultural vegetation and 14 supplementary symbols.

A small map scale 1/30 000 000, gives the vegetation regionalization including 8 regions, and 26 subregions, zones and subzones.

The Editor in Chief is Professor HSIOH - yu HOU.

Pattern of Tibetan forest distribution in relation to hydro-thermal conditions

<table>
<tr><td rowspan="2">Mean annual temperature (°C)</td><td colspan="6">Mean annual precipitation (mm)</td><td rowspan="2">Warmth index (°C)</td></tr>
<tr><td>200</td><td>200-500</td><td>500-600</td><td>600-800</td><td colspan="2">800</td></tr>
<tr><td>(-7)</td><td rowspan="3">Desert</td><td rowspan="4">Desert -steppe</td><td colspan="4">Nival</td><td>0</td></tr>
<tr><td>-7-(-1)</td><td colspan="4">High mountain meadow</td><td>0</td></tr>
<tr><td>-1-2</td><td colspan="4">High mountain scrub</td><td>0-13</td></tr>
<tr><td>2-7</td><td colspan="4">Subalpine coniferous forest</td><td>13-48</td></tr>
<tr><td>7-12</td><td rowspan="2">Vegetation in dry and warm valleys</td><td rowspan="2">Pine forest</td><td rowspan="2">Evergreen quercus forest</td><td>Mixed coniferous and broadleaved forest</td><td>48-77</td></tr>
<tr><td>12-20</td><td>Subtropical evergreen forest</td><td>77-175</td></tr>
<tr><td>20</td><td colspan="3">Tropical monson forest</td><td>Tropical evergreen rain forest</td><td>175</td></tr>
<tr><td rowspan="2"></td><td>30</td><td>30-50</td><td>50-60</td><td colspan="2">60-70</td><td>70</td><td rowspan="2"></td></tr>
<tr><td colspan="6">Mean annual relative humidity</td></tr>
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