Toolik Grid Plots: Baseline canopy height and species composition in 1990

D.A. Walker, M.D. Walker, N.A. Auerbach, H.A. Mol, G.P. Neuhold
Alaska Geobotany Center, University of Alaska Fairbanks

Explanation: Permanent 1 x 1-m plots were sampled in 1990 to establish a baseline for monitoring changes to the vegetation at 85 plot points of the 4.2 x 4.1 km Toolik Lake Grid (see location map, D.A. Walker and Mol (1999)). The grid points are spaced 500 meters apart. Each 1 x 1-m plot was located in a cluster of 25 points (5 x 5 plots) in such a way as to represent a local random sample of the plant community as of the date. A computer point-sampling frame was used for the sampling (Figure 1). A relevé methodology described for the plant community frame (1991) was used and instead of the frame for long-term monitoring (D. D. Walker 1999). The plots are being monitored every 6 years using the same methods.

The map below displays two surfaces for each 1 x 1-m grid. The top (colored) surfaces show the canopy height by each grid point. The bottom surfaces provide the microtopography of the bottom (base) layer of the plant canopy.

This top map on the right side of the poster shows the plant species at top and bottom of the plant canopy.

Figure 1: (Left) Plant species at top sampling. The numbers in the bottom row are the distances from the bottom horizon line to the top and bottom species. The data are presented in a grid of 25 relevés from 10 x 10 plots of the area. The relevés are weighted by the importance of the species prior to sampling. (Right) Two parallel grids of relevé sampling (one above the other), one sampled at 1 m apart and the other sampled at 2 m apart. The relevés were sampled in a grid of 25 relevés of the plant canopy. (This information is used for each grid point of the top and bottom grid are aligned to accuracy and define a point in the plant canopy.)

Figure 2: (Left) Map of the plant species and ground surface topography. (Right) Species at each grid point in the canopy. (Right) Species at each grid point in the understory. The color of the symbols correspond to plant growth forms, and the distribution of color and symbol form correspond to unique species. The "M" are teaching off registration points for alignment of the grid.

Figure 3: (Left) Map of the plant species and ground surface topography. (Right) Species at each grid point in the canopy. (Right) Species at each grid point in the understory. The color of the symbols correspond to plant growth forms, and the distribution of color and symbol form correspond to unique species. The "M" are teaching off registration points for alignment of the grid.

Height of plant canopy and topography of ground surface

<table>
<thead>
<tr>
<th>Height of the plant canopy (m)</th>
<th>0-0.5</th>
<th>0.5-1.0</th>
<th>1.0-1.5</th>
<th>1.5-2.0</th>
<th>2.0-2.5</th>
<th>2.5-3.0</th>
<th>3.0-3.5</th>
<th>3.5-4.0</th>
<th>4.0-4.5</th>
<th>4.5-5.0</th>
<th>5.0-5.5</th>
<th>5.5-6.0</th>
<th>6.0-6.5</th>
<th>6.5-7.0</th>
<th>7.0-7.5</th>
<th>7.5-8.0</th>
<th>8.0-8.5</th>
<th>8.5-9.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topography of ground surface</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>14</td>
<td>15</td>
<td>16</td>
<td>17</td>
</tr>
</tbody>
</table>

Location within Alaska

Location within Toolik Lake (1km scale). The height grid was sampled at 5 m intervals and the samples are portrayed here.