**Research area.**

The magnetic measurements conducted allow three properties to be determined: concentration, grain size, and magnetic mineral type. For the present study all measurements are carried out at room temperature. The Bartington sensor used is the MS2B dual frequency sensor operating at 0.465 kHz (low frequency), and 4.65 kHz (high frequency). Measurements at these two frequencies provide an indication of the form, nature and size distribution of the magnetic minerals in the sample, as well as distinguish magnetic enhancement due to man from that of natural origin. Magnetic susceptibility measurements over a field may vary significantly, but if the frequency dependence is constant and low these are probably due to varying concentration of natural magnetic minerals in the soil. Sites of human activities are usually distinguished as areas of high susceptibility accompanied by increased frequency dependence.



Calculate the fd and fd.

$$χ\_{fd}=\frac{χ\_{fl}-χ\_{fh}}{χ\_{fl}}∙100\% $$

$$κ\_{fd}=\frac{κ\_{fl}-κ\_{fh}}{κ\_{fl}}∙100\% $$

Cerate the map of this petametres and tell me whether pollution with farm is a threat to the lake.

Value above 6% are connected with natural magnetic minerals, value less than 6% are connected with anthropogenic magnetic minerals.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sample** | **x** | **y** | **Low-freq. magnetic Susceptibility ( 10-5 SI)** | **High-freq. magnetic Susceptibility ( 10-5 SI)** |
| A1 | 0 | 0 | 12.97 | 12 |
| A2 | 20 | 0 | 52.85 | 50.32 |
| A3 | 40 | 0 | 31.05 | 30 |
| A4 | 60 | 0 | 110.41 | 106.52 |
| A5 | 80 | 0 | 30.57 | 29.24 |
| A6 | 100 | 0 | 2.37 | 2.24 |
| B1 | 0 | 50 | 19.41 | 18.44 |
| B2 | 20 | 50 | 6.93 | 6.36 |
| B3 | 40 | 50 | 6.41 | 5.92 |
| B4 | 60 | 50 | 8.49 | 7.88 |
| B5 | 80 | 50 | 10.29 | 9.76 |
| B6 | 100 | 50 | 6.05 | 5.48 |
| B7 | 120 | 50 | 9.89 | 9.28 |
| C1 | 0 | 100 | 5.01 | 4.56 |
| C2 | 20 | 100 | 4.93 | 4.48 |
| C3 | 40 | 100 | 5.57 | 5.04 |
| C4 | 60 | 100 | 9.81 | 9.2 |
| C5 | 80 | 100 | 10.65 | 10.04 |
| C6 | 100 | 100 | 15.69 | 14.72 |
| D1 | 0 | 150 | 6.33 | 5.8 |
| D2 | 20 | 150 | 6.25 | 5.68 |
| D3 | 40 | 150 | 5.61 | 5.04 |
| D4 | 60 | 150 | 9.05 | 8.4 |
| D5 | 80 | 150 | 7.17 | 6.56 |
| D6 | 100 | 150 | 5.1 | 4.6 |
| E1 | 0 | 200 | 9.09 | 8.36 |
| E2 | 20 | 200 | 6.21 | 5.72 |
| E3 | 40 | 200 | 6.09 | 5.52 |
| E4 | 60 | 200 | 10.65 | 9.88 |
| E5 | 80 | 200 | 8.05 | 7.24 |
| E6 | 100 | 200 | 8.89 | 8.16 |
| F1 | 0 | 250 | 25.53 | 24.32 |
| F2 | 20 | 250 | 37.21 | 35.6 |
| F3 | 40 | 250 | 6.69 | 6.08 |
| F4 | 60 | 250 | 31.69 | 29.68 |
| F5 | 80 | 250 | 11.69 | 10.92 |
| F6 | 100 | 250 | 44.13 | 42.2 |
| F7 | 120 | 250 | 62.69 | 59.64 |
| G1 | 0 | 300 | 18.17 | 17.24 |
| G2 | 20 | 300 | 29.97 | 28.44 |
| G3 | 40 | 300 | 13.81 | 13.12 |
| G4 | 60 | 300 | 26.29 | 25.08 |
| G5 | 80 | 300 | 18.77 | 17.68 |
| G6 | 100 | 300 | 13.61 | 12.68 |
| G7 | 120 | 300 | 12.21 | 11.44 |
| G8 | 140 | 300 | 35.17 | 33.64 |
| H1 | 0 | 350 | 15.49 | 14.56 |
| H2 | 20 | 350 | 28.41 | 27 |
| H3 | 40 | 350 | 30.45 | 29.12 |
| H4 | 60 | 350 | 18.61 | 17.52 |
| H5 | 80 | 350 | 20.53 | 19.36 |
| H6 | 100 | 350 | 19.37 | 18.36 |
| H7 | 120 | 350 | 17.61 | 16.68 |
| H8 | 140 | 350 | 21.29 | 20.08 |
| H9 | 160 | 350 | 29.85 | 28.32 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **SAMPLE** | **x** | **y** | **Mass (x 10-3kg)** | **Low-freq. magnetic Susceptibility ( 10-5 SI)** | **High-freq. magnetic Susceptibility ( 10-5 SI)** |
| A1 | 0 | 0 | 18.4 | 25.2 | 22.9 |
| A2 | 20 | 0 | 17.2 | 93.1 | 89 |
| A3 | 40 | 0 | 18.3 | 55.2 | 53.1 |
| A4 | 60 | 0 | 17.9 | 207.9 | 196.5 |
| A5 | 80 | 0 | 18.5 | 53.6 | 51.4 |
| B1 | 100 | 0 | 19.9 | 31.1 | 29.7 |
| B2 | 0 | 50 | 19 | 11.8 | 10.8 |
| B3 | 20 | 50 | 19.6 | 10.6 | 9.6 |
| B4 | 40 | 50 | 19.3 | 14.2 | 13.2 |
| B5 | 60 | 50 | 19.6 | 16.8 | 15.7 |
| B6 | 80 | 50 | 18.9 | 10.3 | 9.4 |
| B7 | 100 | 50 | 18.5 | 17.4 | 16.5 |
| C1 | 0 | 50 | 18.5 | 8.9 | 7.9 |
| C2 | 20 | 100 | 18.6 | 8.7 | 8 |
| C3 | 40 | 100 | 18.3 | 9.9 | 9 |
| C4 | 60 | 100 | 18.7 | 17.2 | 16 |
| C5 | 80 | 100 | 18.9 | 18.2 | 17.2 |
| C6 | 100 | 100 | 18.4 | 27.7 | 25.9 |
| D1 | 0 | 100 | 18.9 | 10.9 | 10 |
| D2 | 20 | 150 | 19.4 | 10.5 | 9.5 |
| D3 | 40 | 150 | 18.6 | 9.9 | 8.8 |
| D4 | 60 | 150 | 19.3 | 15 | 14 |
| D5 | 80 | 150 | 20.8 | 10.9 | 9.9 |
| D6 | 100 | 150 | 18.9 | 8.9 | 8 |
| E1 | 0 | 150 | 19.2 | 15.4 | 14.1 |
| E2 | 20 | 200 | 19 | 10.6 | 9.6 |
| E3 | 40 | 200 | 19 | 10.3 | 9.4 |
| E4 | 60 | 200 | 18.8 | 18.4 | 17 |
| E5 | 80 | 200 | 19 | 13.7 | 12.4 |
| E6 | 100 | 200 | 19.1 | 15.1 | 13.7 |
| F1 | 0 | 200 | 19.1 | 43.2 | 41 |
| F2 | 20 | 250 | 19.3 | 62.2 | 59.1 |
| F3 | 40 | 250 | 19.7 | 10.9 | 9.9 |
| F4 | 60 | 250 | 18.9 | 54.3 | 50.8 |
| F5 | 80 | 250 | 19.6 | 19.3 | 18 |
| F6 | 100 | 250 | 19.7 | 71.4 | 68.5 |
| F7 | 120 | 250 | 19.2 | 105 | 99.3 |
| G1 | 0 | 250 | 20.4 | 28.3 | 26.6 |
| G2 | 20 | 300 | 20.5 | 46.2 | 43.9 |
| G3 | 40 | 300 | 20.3 | 21.8 | 20.5 |
| G4 | 60 | 300 | 19.7 | 43.3 | 40.3 |
| G5 | 80 | 300 | 20.8 | 28.6 | 26.8 |
| G6 | 100 | 300 | 20.3 | 21.4 | 19.7 |
| G7 | 120 | 300 | 19.9 | 19.8 | 18.4 |
| G8 | 140 | 300 | 19 | 60.5 | 56.6 |
| H1 | 0 | 300 | 20.6 | 24 | 22.3 |
| H2 | 20 | 350 | 20.7 | 43.4 | 41.1 |
| H3 | 40 | 350 | 20.8 | 46.3 | 44 |
| H4 | 60 | 350 | 20.2 | 29.4 | 27.5 |
| H5 | 80 | 350 | 20.7 | 31.5 | 29.5 |
| H6 | 100 | 350 | 20.5 | 30 | 28.3 |
| H7 | 120 | 350 | 20.8 | 26.8 | 25.3 |
| H8 | 140 | 350 | 20 | 34.1 | 32 |
| H9 | 160 | 350 | 20.9 | 44.8 | 43.7 |