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Supplement of

**Extensive accumulation of rare earth elements in estuarine sediments
affected by leaching of acid sulfate soils**

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XANES analyses

Cerium L_{III}-edge XANES spectra were collected on 6 sediment segments from one of the replicate cores, from the suspended particulate matter (S1, S2) and from the Ce(III) references Ce(III)-sorbed humic acid and Ce(III)-coprecipitated Al(OH)₃. The two Ce(III) references were prepared in a glove box (Ar atmosphere, O₂ < 1 ppm). The former reference was prepared by reacting 70 mg Waskish peat humic acid (purchased from the International Humic Substances Society) with 30 mL deoxygenated 0.001 M Ce³⁺ solution at pH=6 for 2 h. The latter reference was prepared by slowly raising the pH to 5.5, via addition of NaOH, of a deoxygenated 1 L 0.01 M Al³⁺ stocking with 0.2 mM Ce³⁺. After the experiments, the suspensions were centrifuged and washed five times with deoxygenated MQ water.

The XANES measurement was conducted on the multi-pole wiggler beamline I811 at MAX-lab, Lund University, Sweden. The incident X-ray beam, generated by a storage ring operated at 1.5 GeV with beam current of 100-200 mA, was tuned by a double-crystal monochromator (Si [111]) with a size of about 0.5(h)×0.5(v) mm² and a flux of 10¹¹-10¹² photons/sec. High-order harmonics were reduced by detuning the second monochromator crystal to reflect 40% of maximum intensity. Sample was placed at a 45° angle to the incident beam, and fluorescence yield was monitored in fluorescence mode at ambient temperature using a Lytle detector. The unwanted fluorescence signal was reduced by placing a Ti filter and one or two sheets of Al foil between the reference/sample and the detector. To avoid any oxidation, the references and samples were mounted between two layers of Kapton tape in a glove box (Ar atmosphere) at the beamline and the sample chamber was continuously purged with high-purity helium gas during measurement. The energy was calibrated by assigning the first maximum of the derivative of CeO₂ at 5726.2 eV. No radiation-induced damage was observed during data collection, as multiple scans gave identical spectra to one another.

In the software Athena (Ravel and Newville, 2005), multiple XANES scans of each sample and reference were calibrated, aligned and merged into one spectrum each. After pre-edge background removal, the edge jump of the merged spectrum was normalised to unity. The solid-phase speciation of Ce in each sample was quantified by linear combination fitting (LCF) using a number of Ce reference spectra. These included the two spectra collected in this study as well as the spectra of CeO₂, Ce(OH)₄, aqueous Ce³⁺, Ce₂(CO₃)₃, Ce(III)-sorbed mixed-layer clay (ion strength = 0 M, pH=7) and Ce(III)-sorbed 2-line ferrihydrite recorded previously at the same beamline (Yu et al., 2017). The procedure was performed using the Athena software by adding first two reference spectra giving the lowest R-factor, and then adding spectra stepwise as long as the R-factor decreased >10%.

References

- Ravel, B., Newville, M., 2005. ATHENA, ARTEMIS, HEPHAESTUS: data analysis for X-ray absorption spectroscopy using IFEFFIT. *Journal of Synchrotron Radiation*, 12: 537-541.
- Yu, C.X., Drake, H., Mathurin, F.A., Astrom, M., 2017. Cerium sequestration and accumulation in fractured crystalline rock: The role of Mn-Fe (hydr-)oxides and clay minerals. *Geochimica Et Cosmochimica Acta*, 199: 370-389.

Table S1. Total concentrations of iron, aluminium and rare earth elements in the sediment core (Master core4). The mud depositional succession extends from the surface to 346 cm. The data of Fe (Yu et al., 2015) and Al (Yu et al., 2016) are from previous studies.

| Depth cm | Fe g/kg 0.02 | Al g/kg 0.02 | La PPM 0.1 | Ce PPM 0.02 | Pr PPM 0.1 | Nd PPM 0.1 | Sm PPM 0.1 | Eu PPM 0.1 | Gd PPM 0.1 | Tb PPM 0.1 | Dy PPM 0.1 | Ho PPM 0.1 | Er PPM 0.1 | Tm PPM 0.1 | Yb PPM 0.1 | Lu PPM 0.1 |
|-------------|--------------------|--------------------|------------------|-------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| 3--6 | 41.5 | 73.1 | 187.5 | 414.4 | 50.0 | 178.5 | 33.1 | 5.6 | 36.5 | 5.8 | 32.6 | 6.3 | 18.0 | 2.3 | 12.7 | 1.9 |
| 6--8 | 37.1 | 77.0 | 201.6 | 436.8 | 48.9 | 171.4 | 33.3 | 5.5 | 35.8 | 6.0 | 35.4 | 6.8 | 17.8 | 2.2 | 13.1 | 1.9 |
| 8--10 | 35.6 | 81.4 | 218.9 | 472.9 | 54.7 | 199.5 | 36.9 | 6.6 | 40.6 | 6.4 | 36.9 | 7.2 | 19.5 | 2.5 | 14.5 | 2.0 |
| 10--12 | 31.5 | 82.9 | 195.9 | 464.7 | 51.4 | 182.6 | 35.1 | 6.0 | 38.6 | 6.2 | 35.6 | 7.2 | 19.5 | 2.6 | 14.5 | 2.0 |
| 12--14 | 40.2 | 97.6 | 215.4 | 445.8 | 49.5 | 190.5 | 34.1 | 5.7 | 36.1 | 5.7 | 34.2 | 6.7 | 17.0 | 2.3 | 13.8 | 2.0 |
| 14-16 | 39.5 | 79.5 | 206.4 | 439.9 | 53.6 | 181.0 | 34.1 | 6.1 | 36.2 | 6.1 | 31.6 | 6.5 | 17.2 | 2.5 | 13.4 | 2.0 |
| 16-18 | 30.8 | 81.3 | 203.2 | 415.6 | 47.5 | 172.5 | 34.3 | 5.3 | 34.3 | 6.0 | 35.9 | 6.6 | 16.9 | 2.3 | 12.7 | 1.8 |
| 18-20 | 27.9 | 86.7 | 240.5 | 584.6 | 63.9 | 223.9 | 41.8 | 7.3 | 46.4 | 7.5 | 44.6 | 8.5 | 23.3 | 3.0 | 17.1 | 2.3 |
| 20-22 | 39.6 | 83.9 | 206.6 | 474.1 | 53.5 | 197.8 | 37.3 | 6.2 | 41.0 | 6.9 | 39.3 | 7.6 | 19.6 | 2.6 | 15.0 | 2.1 |
| 22-24 | 42.6 | 75.4 | 192.1 | 414.2 | 45.3 | 163.4 | 30.5 | 5.0 | 30.3 | 5.0 | 29.0 | 5.9 | 15.8 | 2.0 | 11.5 | 1.7 |
| 24-26 | 40.5 | 75.7 | 225.9 | 536.9 | 58.0 | 189.3 | 37.4 | 6.5 | 39.0 | 6.6 | 35.7 | 6.8 | 18.9 | 2.5 | 14.0 | 2.2 |
| 26-28 | 45.7 | 76.2 | 220.4 | 499.7 | 51.5 | 188.8 | 33.2 | 5.8 | 38.3 | 6.2 | 34.1 | 6.7 | 17.5 | 2.4 | 13.0 | 2.0 |
| 28-30 | 40.5 | 88.2 | 255.7 | 587.4 | 60.9 | 214.7 | 40.4 | 6.8 | 48.6 | 7.6 | 45.4 | 8.5 | 22.7 | 2.8 | 16.3 | 2.3 |
| 30-32 | 37.3 | 80.3 | 195.0 | 465.9 | 48.4 | 177.8 | 35.0 | 6.1 | 38.9 | 6.6 | 35.4 | 6.8 | 18.1 | 2.6 | 13.7 | 2.0 |
| 32-34 | 39.9 | 111.8 | 268.4 | 663.6 | 66.0 | 240.4 | 45.2 | 7.9 | 48.9 | 8.5 | 48.4 | 9.2 | 25.1 | 3.3 | 18.5 | 2.5 |
| 34-36 | 34.3 | 90.9 | 236.9 | 582.6 | 65.8 | 225.7 | 44.1 | 7.7 | 50.0 | 7.9 | 44.1 | 8.1 | 22.7 | 3.1 | 17.7 | 2.6 |
| 36-38 | 41.2 | 81.7 | 221.3 | 490.8 | 49.2 | 175.6 | 35.1 | 5.8 | 36.2 | 6.2 | 34.3 | 6.7 | 17.2 | 2.3 | 13.2 | 2.0 |
| 38-40 | 41.4 | 79.3 | 160.6 | 336.8 | 40.3 | 142.1 | 27.3 | 4.6 | 29.7 | 4.7 | 27.6 | 5.4 | 14.4 | 1.8 | 10.5 | 1.5 |
| 40-42 | 40.8 | 87.6 | 162.9 | 329.6 | 37.7 | 140.9 | 25.3 | 3.9 | 26.0 | 4.0 | 24.1 | 4.8 | 12.0 | 1.6 | 9.7 | 1.3 |
| 42-44 | 40.6 | 74.2 | 162.2 | 332.7 | 39.8 | 145.1 | 25.5 | 4.4 | 30.1 | 4.6 | 26.7 | 5.1 | 13.8 | 1.7 | 10.1 | 1.4 |
| 44-46 | 39.6 | 70.3 | 145.4 | 310.1 | 35.3 | 126.9 | 24.2 | 4.0 | 25.3 | 4.0 | 24.3 | 4.6 | 12.0 | 1.5 | 9.3 | 1.3 |
| 46-48 | 37.9 | 79.4 | 183.0 | 399.4 | 44.7 | 158.4 | 30.3 | 5.0 | 32.3 | 5.2 | 30.7 | 6.0 | 16.4 | 2.0 | 11.2 | 1.6 |
| 48-50 | 39.2 | 92.5 | 212.9 | 490.9 | 50.5 | 186.1 | 34.7 | 6.1 | 37.9 | 5.9 | 34.8 | 6.9 | 17.8 | 2.4 | 13.1 | 1.9 |
| 50-52 | 41.3 | 100.1 | 185.8 | 400.9 | 44.3 | 164.6 | 30.5 | 5.2 | 31.7 | 5.0 | 30.7 | 5.9 | 15.4 | 2.1 | 13.0 | 1.8 |
| 52-54 | 45.9 | 72.5 | 176.2 | 390.3 | 42.3 | 148.7 | 27.3 | 4.4 | 30.5 | 4.6 | 26.7 | 5.4 | 14.0 | 2.0 | 11.1 | 1.6 |
| 54-56 | 37.3 | 82.8 | 207.4 | 478.1 | 53.0 | 180.5 | 34.1 | 6.1 | 38.4 | 6.4 | 35.3 | 7.3 | 19.9 | 2.6 | 14.2 | 2.1 |
| 56-58 | 37.2 | 89.2 | 211.4 | 486.7 | 51.7 | 185.2 | 37.1 | 5.9 | 40.2 | 6.5 | 39.3 | 7.4 | 20.7 | 2.4 | 14.3 | 2.1 |
| 58-60 | 38.1 | 84.2 | 201.9 | 461.3 | 51.3 | 186.6 | 33.0 | 6.1 | 39.2 | 6.2 | 35.3 | 7.5 | 19.8 | 2.7 | 13.9 | 2.1 |
| 60-62 | 34.9 | 109.0 | 255.8 | 595.7 | 61.4 | 219.4 | 42.9 | 7.0 | 46.2 | 8.0 | 45.9 | 8.5 | 23.5 | 3.1 | 17.7 | 2.4 |
| 62-64 | 41.8 | 82.5 | 198.2 | 492.5 | 48.8 | 170.5 | 31.3 | 5.3 | 32.2 | 6.0 | 32.3 | 6.7 | 16.8 | 2.3 | 12.8 | 1.9 |
| 64-66 | 43.3 | 86.6 | 160.5 | 369.5 | 38.1 | 138.3 | 25.5 | 4.2 | 27.4 | 4.6 | 25.1 | 5.3 | 14.0 | 1.9 | 10.4 | 1.5 |
| 66-68 | 43.9 | 74.2 | 172.9 | 377.5 | 40.3 | 142.6 | 25.7 | 4.5 | 27.2 | 4.5 | 26.3 | 5.3 | 14.2 | 2.0 | 10.7 | 1.5 |
| 68-70 | 39.1 | 69.9 | 149.0 | 339.7 | 35.9 | 125.5 | 23.2 | 4.0 | 25.2 | 4.1 | 23.7 | 4.5 | 12.3 | 1.7 | 9.5 | 1.4 |
| 70-72 | 46.2 | 74.3 | 153.9 | 347.0 | 33.8 | 126.4 | 21.9 | 3.7 | 23.6 | 3.7 | 22.3 | 4.2 | 10.9 | 1.5 | 9.0 | 1.3 |
| 72-74 | 46.0 | 70.7 | 177.0 | 400.6 | 40.4 | 142.2 | 26.2 | 4.2 | 27.6 | 4.3 | 25.8 | 4.8 | 13.0 | 1.8 | 10.6 | 1.4 |
| 74-76 | 44.6 | 90.2 | 198.6 | 477.6 | 45.6 | 171.0 | 31.7 | 5.1 | 32.0 | 5.3 | 29.1 | 5.6 | 15.5 | 2.1 | 11.4 | 1.7 |
| 76-78 | 43.9 | 74.5 | 189.5 | 434.0 | 45.0 | 160.8 | 28.0 | 4.7 | 32.2 | 5.5 | 30.5 | 6.0 | 15.8 | 2.1 | 11.7 | 1.6 |
| 78-80 | 40.6 | 78.3 | 185.7 | 424.6 | 43.7 | 157.7 | 28.8 | 4.9 | 31.2 | 5.1 | 29.8 | 5.8 | 16.3 | 1.9 | 11.6 | 1.7 |
| 80-82 | 41.6 | 84.9 | 188.6 | 446.6 | 45.5 | 164.4 | 29.7 | 5.0 | 30.1 | 5.2 | 29.7 | 5.9 | 15.6 | 2.0 | 11.6 | 1.7 |
| 82-84 | 46.3 | 73.5 | 179.6 | 413.8 | 42.0 | 144.8 | 26.5 | 4.5 | 27.5 | 4.6 | 27.2 | 5.3 | 14.2 | 1.9 | 10.9 | 1.5 |
| 84-86 | 42.9 | 75.6 | 190.4 | 442.3 | 46.0 | 166.0 | 28.3 | 4.9 | 31.7 | 5.3 | 30.8 | 5.9 | 15.7 | 2.2 | 11.9 | 1.8 |
| 86-88 | 46.7 | 68.9 | 170.5 | 379.4 | 44.5 | 147.4 | 27.0 | 4.8 | 30.8 | 4.6 | 27.1 | 5.1 | 15.1 | 2.0 | 10.6 | 1.6 |
| 88-90 | 50.6 | 71.2 | 165.6 | 367.6 | 38.9 | 137.5 | 25.3 | 4.0 | 25.6 | 4.5 | 25.5 | 5.1 | 13.5 | 1.7 | 9.9 | 1.4 |
| 90-92 | 40.1 | 76.4 | 182.4 | 413.2 | 43.7 | 156.9 | 27.2 | 4.7 | 29.8 | 4.8 | 27.0 | 5.3 | 14.4 | 1.9 | 10.5 | 1.5 |
| 92-94 | 38.5 | 77.8 | 197.9 | 427.8 | 48.4 | 171.8 | 31.3 | 5.1 | 33.6 | 5.4 | 32.2 | 6.4 | 16.3 | 2.1 | 11.9 | 1.7 |
| 94-96 | 42.4 | 73.2 | 210.4 | 463.1 | 47.9 | 167.4 | 30.7 | 4.9 | 33.7 | 5.2 | 30.9 | 5.7 | 15.8 | 1.9 | 11.7 | 1.7 |
| 96-98 | 39.4 | 88.6 | 180.5 | 399.7 | 41.9 | 158.9 | 30.3 | 4.9 | 30.4 | 5.0 | 28.1 | 5.7 | 14.0 | 1.9 | 11.5 | 1.6 |
| 98-100 | 43.2 | 83.0 | 209.5 | 467.1 | 48.5 | 168.6 | 31.5 | 5.2 | 34.4 | 5.4 | 33.2 | 6.5 | 16.8 | 2.1 | 12.8 | 1.9 |
| 100-102 | 40.0 | 78.0 | 203.2 | 492.1 | 53.3 | 188.3 | 33.0 | 5.8 | 39.1 | 6.1 | 35.8 | 6.9 | 18.7 | 2.5 | 13.9 | 2.2 |
| 102-104 | 28.2 | 92.5 | 237.1 | 629.5 | 63.0 | 231.7 | 42.8 | 7.1 | 46.9 | 7.7 | 45.4 | 8.8 | 23.5 | 3.1 | 17.6 | 2.6 |
| 104-106 | 36.7 | 106.0 | 251.4 | 543.4 | 57.0 | 206.7 | 38.0 | 6.0 | 42.2 | 6.5 | 40.2 | 7.6 | 19.8 | 2.6 | 16.2 | 2.1 |
| 106-108 | 44.1 | 72.3 | 149.8 | 346.5 | 37.7 | 133.4 | 25.0 | 4.2 | 27.3 | 4.6 | 26.0 | 5.0 | 13.7 | 1.9 | 10.4 | 1.5 |
| 108-110 | 34.0 | 83.3 | 192.9 | 450.0 | 55.2 | 185.3 | 34.5 | 6.0 | 41.1 | 6.3 | 37.5 | 7.1 | 19.9 | 2.6 | 14.7 | 2.2 |
| 110-112 | 31.1 | 78.4 | 181.2 | 429.3 | 48.1 | 171.8 | 33.0 | 5.9 | 33.5 | 5.5 | 31.8 | 6.2 | 16.4 | 2.2 | 12.5 | 1.9 |
| 112-114 | 35.2 | 80.5 | 195.4 | 461.0 | 47.7 | 168.7 | 30.7 | 4.8 | 33.7 | 5.4 | 30.7 | 6.1 | 16.1 | 2.2 | 12.8 | 1.7 |
| 114-116 | 46.6 | 78.8 | 159.1 | 366.6 | 39.2 | 142.3 | 25.6 | 4.6 | 30.2 | 4.8 | 27.1 | 5.4 | 14.6 | 1.9 | 10.9 | 1.5 |
| 116-118 | 39.1 | 80.3 | 186.8 | 443.6 | 48.4 | 167.0 | 30.2 | 5.4 | 31.8 | 5.5 | 30.3 | 6.1 | 16.7 | 2.2 | 12.1 | 1.9 |
| 118-120 | 43.1 | 86.5 | 169.4 | 369.1 | 40.8 | 141.8 | 26.8 | 4.5 | 28.7 | 4.7 | 27.2 | 5.0 | 14.2 | 1.8 | 10.3 | 1.5 |
| 120-122 | 43.4 | 71.4 | 135.6 | 295.2 | 33.0 | 117.3 | 22.3 | 3.9 | 24.7 | 3.9 | 22.5 | 4.1 | 11.0 | 1.4 | 8.4 | 1.2 |

| | | | | | | | | | | | | | | | | |
|---------|------|-------|-------|-------|------|-------|------|-----|------|-----|------|-----|------|-----|------|-----|
| 122-124 | 43.4 | 79.3 | 166.1 | 370.1 | 39.1 | 137.0 | 26.3 | 4.5 | 28.2 | 4.9 | 28.4 | 5.3 | 15.0 | 1.8 | 10.3 | 1.5 |
| 124-126 | 35.5 | 77.4 | 164.9 | 397.2 | 41.9 | 148.5 | 28.8 | 4.7 | 31.3 | 4.9 | 29.0 | 5.5 | 15.0 | 2.0 | 11.6 | 1.6 |
| 126-128 | 45.5 | 79.7 | 144.2 | 320.3 | 33.7 | 123.3 | 23.6 | 3.8 | 25.4 | 4.2 | 24.7 | 4.7 | 12.3 | 1.7 | 9.6 | 1.4 |
| 128-130 | 37.6 | 89.6 | 189.4 | 464.5 | 45.9 | 165.2 | 30.4 | 5.2 | 31.4 | 5.2 | 30.9 | 5.8 | 15.6 | 2.1 | 11.9 | 1.7 |
| 130-132 | 45.0 | 82.3 | 180.4 | 386.2 | 46.2 | 156.7 | 30.0 | 4.8 | 31.6 | 5.5 | 29.4 | 5.7 | 15.5 | 2.2 | 12.0 | 1.7 |
| 132-134 | 39.6 | 81.5 | 179.9 | 434.4 | 49.3 | 163.8 | 30.5 | 5.3 | 31.2 | 5.5 | 30.7 | 6.1 | 16.1 | 2.2 | 12.3 | 1.7 |
| 134-136 | 37.9 | 83.1 | 232.9 | 551.0 | 59.7 | 202.1 | 39.5 | 6.8 | 43.5 | 7.2 | 40.5 | 7.8 | 20.3 | 2.8 | 15.4 | 2.4 |
| 136-138 | 40.7 | 81.0 | 212.9 | 509.2 | 50.6 | 184.9 | 33.4 | 5.5 | 33.6 | 5.9 | 34.6 | 7.0 | 18.0 | 2.3 | 12.9 | 1.8 |
| 138-140 | 48.1 | 90.8 | 201.1 | 463.5 | 46.9 | 166.2 | 30.1 | 5.2 | 34.0 | 5.3 | 30.0 | 6.1 | 16.2 | 2.1 | 12.5 | 1.7 |
| 140-142 | 39.6 | 84.4 | 174.1 | 376.4 | 39.4 | 144.4 | 26.0 | 4.3 | 27.6 | 4.4 | 26.6 | 5.3 | 13.6 | 1.8 | 11.0 | 1.5 |
| 142-144 | 43.4 | 76.3 | 175.3 | 390.2 | 46.3 | 156.2 | 28.0 | 5.0 | 33.8 | 5.4 | 30.4 | 5.7 | 15.4 | 2.0 | 11.4 | 1.8 |
| 144-146 | 35.2 | 87.5 | 212.3 | 568.5 | 57.7 | 198.2 | 35.3 | 6.3 | 38.5 | 6.7 | 37.6 | 7.2 | 19.8 | 2.6 | 14.9 | 2.3 |
| 146-148 | 37.6 | 88.7 | 165.5 | 362.9 | 42.7 | 151.3 | 29.2 | 5.0 | 29.2 | 5.5 | 30.6 | 5.6 | 15.2 | 2.2 | 12.7 | 1.8 |
| 148-150 | 34.6 | 84.8 | 153.2 | 354.3 | 40.5 | 144.3 | 28.7 | 4.8 | 31.3 | 4.9 | 29.2 | 5.7 | 15.3 | 1.9 | 12.0 | 1.7 |
| 150-152 | 45.2 | 81.2 | 137.3 | 278.0 | 30.6 | 113.6 | 20.9 | 3.4 | 23.0 | 3.4 | 21.0 | 4.1 | 10.5 | 1.5 | 8.5 | 1.2 |
| 152-154 | 44.9 | 70.3 | 118.7 | 258.6 | 29.3 | 108.1 | 19.1 | 3.3 | 21.3 | 3.3 | 19.8 | 3.7 | 10.5 | 1.3 | 7.9 | 1.1 |
| 154-156 | 47.9 | 82.1 | 165.6 | 341.3 | 37.1 | 131.6 | 24.7 | 4.0 | 25.4 | 4.0 | 24.9 | 4.8 | 12.9 | 1.7 | 9.9 | 1.3 |
| 156-158 | 40.5 | 99.7 | 185.8 | 397.9 | 42.6 | 159.9 | 28.4 | 4.8 | 32.1 | 5.0 | 30.0 | 5.9 | 15.6 | 2.1 | 12.0 | 1.8 |
| 158-160 | 37.8 | 83.8 | 191.7 | 456.5 | 48.9 | 169.3 | 31.7 | 5.5 | 35.8 | 6.1 | 34.6 | 6.9 | 17.7 | 2.4 | 13.5 | 2.0 |
| 160-162 | 45.7 | 71.2 | 121.5 | 263.0 | 29.4 | 104.8 | 18.6 | 3.4 | 20.9 | 3.4 | 19.7 | 3.7 | 10.3 | 1.4 | 7.9 | 1.1 |
| 162-164 | 38.3 | 77.6 | 149.0 | 320.6 | 37.7 | 132.0 | 24.1 | 4.2 | 26.9 | 4.3 | 25.2 | 4.9 | 13.8 | 1.8 | 10.4 | 1.4 |
| 164-166 | 33.2 | 88.4 | 165.0 | 357.1 | 41.6 | 150.1 | 28.4 | 4.7 | 29.1 | 5.1 | 30.8 | 6.1 | 16.1 | 2.0 | 11.5 | 1.8 |
| 166-168 | 34.1 | 95.4 | 185.8 | 417.3 | 48.8 | 172.4 | 32.7 | 5.7 | 36.5 | 6.0 | 34.2 | 6.5 | 17.2 | 2.4 | 13.7 | 1.9 |
| 168-170 | 33.9 | 86.3 | 166.8 | 378.4 | 45.3 | 153.9 | 28.6 | 5.2 | 32.9 | 5.5 | 32.5 | 6.1 | 17.3 | 2.2 | 12.6 | 1.7 |
| 170-172 | 35.7 | 108.1 | 169.8 | 368.6 | 42.4 | 163.1 | 30.0 | 5.2 | 31.9 | 5.1 | 32.0 | 6.0 | 16.1 | 2.1 | 12.6 | 1.8 |
| 172-174 | 35.7 | 82.4 | 167.0 | 388.3 | 41.7 | 150.2 | 29.5 | 4.9 | 32.6 | 5.3 | 30.1 | 5.9 | 15.9 | 2.1 | 12.3 | 1.6 |
| 174-176 | 37.6 | 83.1 | 199.6 | 419.5 | 45.9 | 163.8 | 31.9 | 5.1 | 34.9 | 5.6 | 33.2 | 6.3 | 17.2 | 2.1 | 11.8 | 1.8 |
| 176-178 | 38.5 | 87.3 | 153.1 | 338.2 | 39.7 | 146.7 | 27.0 | 4.6 | 29.6 | 4.8 | 27.6 | 5.6 | 15.0 | 1.9 | 11.1 | 1.5 |
| 178-180 | 39.9 | 86.0 | 119.6 | 247.3 | 28.7 | 104.5 | 20.3 | 3.3 | 21.7 | 3.6 | 21.1 | 4.0 | 10.8 | 1.5 | 8.5 | 1.2 |
| 180-182 | 39.2 | 85.6 | 143.1 | 306.6 | 35.3 | 127.7 | 23.1 | 4.4 | 24.9 | 4.5 | 24.3 | 4.7 | 13.3 | 1.8 | 10.2 | 1.6 |
| 182-184 | 42.0 | 77.4 | 122.1 | 261.5 | 30.0 | 107.5 | 19.6 | 3.4 | 20.8 | 3.7 | 20.3 | 3.8 | 10.3 | 1.4 | 8.1 | 1.3 |
| 184-186 | 44.6 | 71.8 | 107.1 | 220.1 | 25.4 | 88.7 | 17.2 | 2.9 | 17.8 | 2.7 | 16.7 | 3.3 | 8.8 | 1.1 | 6.7 | 1.0 |
| 186-188 | 47.0 | 67.6 | 100.5 | 209.4 | 24.2 | 84.7 | 14.5 | 2.7 | 16.1 | 2.5 | 13.9 | 2.9 | 7.3 | 1.1 | 5.9 | 0.9 |
| 188-190 | 46.4 | 65.5 | 92.1 | 193.2 | 21.1 | 73.0 | 13.6 | 2.4 | 13.7 | 2.3 | 12.2 | 2.5 | 6.6 | 0.9 | 5.6 | 0.8 |
| 190-192 | 46.4 | 65.4 | 96.8 | 198.5 | 22.2 | 77.3 | 13.5 | 2.5 | 14.2 | 2.3 | 13.5 | 2.6 | 7.4 | 1.0 | 5.6 | 0.8 |
| 192-194 | 47.0 | 69.1 | 99.7 | 201.5 | 23.5 | 80.3 | 13.9 | 2.4 | 16.4 | 2.6 | 14.9 | 2.9 | 7.6 | 1.0 | 6.1 | 0.9 |
| 194-196 | 49.1 | 79.2 | 95.9 | 192.1 | 22.4 | 75.1 | 13.8 | 2.4 | 14.0 | 2.2 | 13.3 | 2.5 | 7.0 | 1.0 | 5.6 | 0.8 |
| 196-198 | 45.1 | 68.9 | 101.2 | 201.4 | 22.9 | 78.8 | 14.9 | 2.5 | 15.5 | 2.4 | 14.3 | 2.7 | 7.7 | 0.9 | 6.0 | 0.8 |
| 198-200 | 44.7 | 70.1 | 104.5 | 216.3 | 23.4 | 81.4 | 13.4 | 2.6 | 15.3 | 2.6 | 13.8 | 2.8 | 7.6 | 1.1 | 5.9 | 1.0 |
| 200-202 | 47.8 | 63.1 | 97.6 | 199.9 | 21.2 | 73.4 | 12.8 | 2.3 | 14.2 | 2.1 | 12.9 | 2.6 | 6.9 | 0.9 | 5.5 | 0.8 |
| 202-204 | 48.0 | 65.9 | 89.0 | 180.9 | 19.7 | 69.3 | 12.7 | 2.2 | 13.0 | 2.2 | 12.4 | 2.5 | 7.0 | 0.9 | 5.2 | 0.7 |
| 204-206 | 47.5 | 66.7 | 89.8 | 187.4 | 20.8 | 73.3 | 12.3 | 2.1 | 12.3 | 2.0 | 11.4 | 2.2 | 6.7 | 0.9 | 4.8 | 0.8 |
| 206-208 | 47.1 | 65.0 | 92.8 | 191.0 | 21.8 | 74.9 | 13.9 | 2.5 | 14.6 | 2.3 | 13.0 | 2.6 | 6.9 | 0.9 | 5.4 | 0.9 |
| 208-210 | 51.5 | 60.5 | 82.3 | 167.5 | 18.4 | 65.0 | 12.1 | 2.0 | 11.4 | 1.7 | 9.9 | 2.1 | 5.3 | 0.7 | 4.6 | 0.6 |
| 210-212 | 49.4 | 63.3 | 94.2 | 192.0 | 22.4 | 75.9 | 13.3 | 2.4 | 13.2 | 2.1 | 12.0 | 2.3 | 6.9 | 1.0 | 5.1 | 0.9 |
| 212-214 | 50.9 | 68.0 | 89.0 | 179.8 | 20.5 | 71.0 | 12.4 | 2.2 | 12.4 | 1.9 | 11.1 | 2.3 | 6.4 | 0.9 | 5.3 | 0.8 |
| 214-216 | 49.7 | 67.0 | 90.5 | 194.8 | 21.3 | 72.4 | 12.8 | 2.2 | 11.9 | 2.0 | 11.7 | 2.3 | 6.3 | 0.9 | 5.2 | 0.8 |
| 216-218 | 47.3 | 66.2 | 95.3 | 188.4 | 20.3 | 74.9 | 13.0 | 2.3 | 12.7 | 2.1 | 11.9 | 2.4 | 6.5 | 0.9 | 5.1 | 0.8 |
| 218-220 | 47.6 | 74.7 | 109.9 | 227.2 | 25.5 | 90.3 | 16.3 | 2.7 | 16.2 | 2.8 | 16.3 | 3.3 | 8.9 | 1.2 | 7.3 | 1.0 |
| 220-222 | 46.7 | 77.1 | 108.2 | 228.8 | 25.4 | 89.8 | 15.5 | 2.8 | 17.1 | 2.7 | 15.2 | 3.0 | 8.3 | 1.1 | 6.3 | 0.9 |
| 222-224 | 54.2 | 63.2 | 79.1 | 160.2 | 18.0 | 63.3 | 11.4 | 2.0 | 11.8 | 1.9 | 10.4 | 2.1 | 6.0 | 0.8 | 4.5 | 0.7 |
| 224-226 | 51.3 | 61.0 | 79.2 | 156.3 | 17.2 | 60.0 | 10.3 | 1.8 | 11.5 | 1.9 | 10.4 | 1.9 | 5.5 | 0.7 | 4.3 | 0.7 |
| 226-228 | 51.3 | 69.5 | 102.5 | 205.8 | 23.1 | 79.8 | 13.8 | 2.5 | 15.3 | 2.4 | 14.4 | 2.8 | 7.8 | 1.0 | 6.1 | 0.9 |
| 228-230 | 46.7 | 70.4 | 102.9 | 211.2 | 24.3 | 81.3 | 14.8 | 2.7 | 15.6 | 2.5 | 14.3 | 2.7 | 7.8 | 1.0 | 5.8 | 0.9 |
| 230-232 | 47.4 | 67.1 | 90.9 | 187.5 | 20.7 | 71.7 | 13.2 | 2.3 | 13.0 | 2.1 | 11.6 | 2.4 | 6.6 | 0.8 | 5.3 | 0.7 |
| 232-234 | 45.0 | 68.5 | 100.4 | 202.1 | 22.8 | 80.6 | 14.8 | 2.6 | 14.8 | 2.5 | 14.3 | 2.7 | 7.7 | 1.0 | 5.9 | 1.0 |
| 234-236 | 47.1 | 73.2 | 106.0 | 206.9 | 23.8 | 82.4 | 15.1 | 2.6 | 16.7 | 2.6 | 15.5 | 3.0 | 8.3 | 1.0 | 6.2 | 0.9 |
| 236-238 | 50.6 | 75.4 | 92.4 | 177.3 | 19.6 | 68.8 | 12.9 | 2.3 | 12.7 | 2.0 | 11.5 | 2.4 | 6.4 | 0.9 | 5.0 | 0.8 |
| 238-240 | 50.7 | 65.3 | 74.5 | 140.4 | 15.2 | 56.1 | 10.1 | 1.7 | 9.6 | 1.6 | 8.9 | 1.8 | 5.0 | 0.7 | 4.1 | 0.6 |
| 240-242 | 50.1 | 69.8 | 88.2 | 177.4 | 20.7 | 68.9 | 12.1 | 2.1 | 12.9 | 2.1 | 11.9 | 2.2 | 6.6 | 0.8 | 5.2 | 0.8 |
| 242-244 | 48.3 | 62.6 | 67.4 | 134.0 | 15.0 | 53.8 | 9.8 | 1.6 | 9.4 | 1.5 | 8.3 | 1.7 | 5.0 | 0.7 | 4.0 | 0.6 |
| 244-246 | 50.4 | 64.0 | 59.2 | 109.5 | 13.0 | 47.3 | 8.7 | 1.5 | 8.3 | 1.2 | 7.5 | 1.5 | 4.0 | 0.5 | 3.5 | 0.5 |
| 246-248 | 49.0 | 64.1 | 57.9 | 111.4 | 13.1 | 47.6 | 8.2 | 1.5 | 8.0 | 1.3 | 7.1 | 1.4 | 4.3 | 0.6 | 3.4 | 0.5 |
| 248-250 | 50.2 | 65.1 | 65.5 | 129.3 | 15.2 | 53.9 | 9.5 | 1.8 | 9.1 | 1.5 | 8.3 | 1.6 | 4.7 | 0.6 | 3.8 | 0.6 |
| 250-252 | 49.5 | 67.5 | 67.0 | 129.1 | 14.6 | 53.5 | 9.8 | 1.8 | 9.4 | 1.5 | 8.4 | 1.7 | 4.9 | 0.7 | 4.1 | 0.6 |
| 252-254 | 47.4 | 65.8 | 73.5 | 146.3 | 17.8 | 59.2 | 10.3 | 2.0 | 11.1 | 1.7 | 9.1 | 1.9 | 5.4 | 0.8 | 4.6 | 0.7 |
| 254-256 | 49.2 | 67.6 | 62.2 | 122.5 | 14.3 | 50.1 | 8.6 | 1.6 | 8.4 | 1.3 | 8.0 | 1.6 | 4.5 | 0.6 | 3.7 | 0.6 |
| 256-258 | 50.8 | 70.7 | 68.0 | 132.9 | 15.0 | 56.4 | 10.4 | 1.7 | 10.3 | 1.5 | 8.6 | 1.7 | 5.0 | 0.7 | 4.1 | 0.6 |

| | | | | | | | | | | | | | | | | |
|---------|------|------|------|-------|------|------|------|-----|------|-----|------|-----|-----|-----|-----|-----|
| 258-260 | 48.7 | 64.6 | 64.3 | 128.0 | 15.3 | 53.3 | 9.1 | 1.7 | 9.0 | 1.4 | 8.0 | 1.6 | 4.8 | 0.7 | 4.0 | 0.6 |
| 260-262 | 48.9 | 72.0 | 74.9 | 149.6 | 17.1 | 60.0 | 11.5 | 1.9 | 10.8 | 1.7 | 10.0 | 2.0 | 5.9 | 0.7 | 4.6 | 0.8 |
| 262-264 | 51.6 | 76.9 | 76.0 | 147.0 | 15.8 | 58.2 | 10.6 | 1.7 | 10.8 | 1.5 | 9.2 | 1.9 | 5.3 | 0.7 | 4.3 | 0.6 |
| 264-266 | 47.4 | 66.5 | 71.6 | 143.0 | 16.5 | 56.7 | 10.2 | 1.7 | 9.6 | 1.6 | 8.7 | 1.7 | 5.1 | 0.7 | 4.3 | 0.6 |
| 266-268 | 50.1 | 64.8 | 67.8 | 130.8 | 15.5 | 55.3 | 9.8 | 1.7 | 10.2 | 1.5 | 8.1 | 1.7 | 4.8 | 0.7 | 4.1 | 0.6 |
| 268-270 | 48.7 | 66.5 | 73.0 | 149.1 | 17.3 | 60.0 | 10.4 | 1.9 | 10.2 | 1.7 | 9.5 | 2.0 | 5.4 | 0.7 | 4.3 | 0.7 |
| 270-272 | 49.4 | 66.3 | 65.0 | 133.4 | 15.0 | 52.5 | 9.5 | 1.7 | 8.2 | 1.5 | 8.2 | 1.7 | 4.4 | 0.7 | 4.0 | 0.6 |
| 272-274 | 47.9 | 64.4 | 68.4 | 128.1 | 14.0 | 53.8 | 9.3 | 1.7 | 8.8 | 1.3 | 8.4 | 1.6 | 4.0 | 0.6 | 3.9 | 0.6 |
| 274-276 | 47.6 | 74.1 | 91.3 | 177.1 | 20.1 | 72.6 | 13.8 | 2.3 | 13.9 | 2.2 | 13.0 | 2.5 | 7.3 | 0.9 | 5.6 | 0.8 |
| 276-278 | 51.9 | 65.4 | 80.7 | 157.1 | 17.6 | 66.0 | 11.9 | 1.9 | 11.6 | 1.8 | 11.2 | 2.2 | 5.6 | 0.8 | 4.8 | 0.7 |
| 278-280 | 52.4 | 72.5 | 69.7 | 135.8 | 16.2 | 57.1 | 10.9 | 1.9 | 10.1 | 1.7 | 9.7 | 1.9 | 5.3 | 0.7 | 4.6 | 0.6 |
| 280-282 | 50.5 | 66.1 | 61.1 | 119.1 | 13.7 | 49.9 | 8.9 | 1.6 | 9.1 | 1.3 | 7.6 | 1.5 | 4.2 | 0.6 | 3.6 | 0.5 |
| 282-284 | 49.4 | 67.1 | 59.8 | 112.7 | 13.5 | 47.8 | 8.5 | 1.6 | 7.8 | 1.2 | 7.2 | 1.5 | 4.2 | 0.6 | 3.5 | 0.5 |
| 284-286 | 48.8 | 65.2 | 60.0 | 115.1 | 13.5 | 47.8 | 8.6 | 1.5 | 8.1 | 1.3 | 7.8 | 1.5 | 4.1 | 0.6 | 3.6 | 0.6 |
| 286-288 | 49.2 | 63.9 | 57.2 | 109.7 | 12.9 | 47.2 | 8.4 | 1.4 | 7.9 | 1.3 | 6.9 | 1.3 | 3.8 | 0.5 | 3.4 | 0.6 |
| 288-290 | 48.2 | 64.4 | 64.4 | 120.4 | 13.8 | 50.8 | 8.9 | 1.5 | 8.0 | 1.3 | 7.8 | 1.6 | 4.0 | 0.6 | 3.6 | 0.6 |
| 290-292 | 49.5 | 70.4 | 62.2 | 114.7 | 14.1 | 50.7 | 9.8 | 1.7 | 9.1 | 1.3 | 7.9 | 1.4 | 4.4 | 0.6 | 3.7 | 0.5 |
| 292-294 | 48.0 | 69.7 | 58.3 | 110.6 | 12.8 | 47.3 | 8.9 | 1.6 | 8.0 | 1.2 | 7.2 | 1.4 | 4.0 | 0.5 | 3.5 | 0.5 |
| 294-296 | 48.5 | 67.6 | 65.1 | 124.1 | 13.6 | 53.9 | 9.1 | 1.5 | 8.2 | 1.3 | 7.9 | 1.5 | 4.1 | 0.6 | 3.8 | 0.6 |
| 296-298 | 48.1 | 62.7 | 55.6 | 101.0 | 12.3 | 45.1 | 8.5 | 1.4 | 7.8 | 1.2 | 7.0 | 1.4 | 4.0 | 0.5 | 3.6 | 0.6 |
| 298-300 | 48.3 | 68.8 | 58.2 | 120.5 | 14.2 | 50.7 | 8.6 | 1.5 | 7.8 | 1.4 | 7.2 | 1.5 | 3.9 | 0.6 | 3.7 | 0.6 |
| 300-302 | 47.9 | 63.8 | 61.4 | 121.6 | 14.0 | 50.3 | 8.9 | 1.7 | 9.2 | 1.4 | 8.2 | 1.6 | 4.6 | 0.6 | 3.8 | 0.5 |
| 302-304 | 52.9 | 66.9 | 59.2 | 120.1 | 14.4 | 50.4 | 8.5 | 1.6 | 7.7 | 1.3 | 7.4 | 1.5 | 4.0 | 0.6 | 3.3 | 0.5 |
| 304-306 | 50.8 | 67.6 | 60.6 | 123.2 | 14.5 | 53.2 | 9.5 | 1.7 | 9.0 | 1.3 | 7.9 | 1.6 | 4.1 | 0.6 | 3.8 | 0.6 |
| 306-308 | 50.0 | 65.2 | 55.1 | 106.8 | 13.1 | 45.4 | 8.4 | 1.5 | 7.9 | 1.2 | 7.1 | 1.3 | 4.1 | 0.6 | 3.4 | 0.5 |
| 308-310 | 50.0 | 64.9 | 61.3 | 118.8 | 14.7 | 51.3 | 9.3 | 1.7 | 9.1 | 1.3 | 7.3 | 1.5 | 4.4 | 0.6 | 3.6 | 0.5 |
| 310-312 | 47.0 | 63.9 | 55.1 | 102.9 | 11.7 | 44.6 | 8.1 | 1.3 | 7.3 | 1.1 | 6.7 | 1.3 | 3.5 | 0.5 | 3.2 | 0.5 |
| 312-314 | 54.8 | 65.4 | 55.2 | 106.5 | 12.2 | 44.4 | 8.1 | 1.5 | 8.0 | 1.2 | 6.8 | 1.3 | 3.7 | 0.5 | 3.3 | 0.5 |
| 314-316 | 49.5 | 62.7 | 62.2 | 125.3 | 15.5 | 53.9 | 10.3 | 1.8 | 9.9 | 1.5 | 8.2 | 1.5 | 4.6 | 0.6 | 3.9 | 0.6 |
| 316-318 | 52.2 | 66.3 | 56.4 | 108.6 | 12.9 | 46.0 | 8.7 | 1.5 | 8.2 | 1.2 | 7.3 | 1.4 | 4.3 | 0.5 | 3.6 | 0.5 |
| 318-320 | 50.3 | 63.0 | 54.4 | 102.6 | 12.3 | 44.7 | 7.6 | 1.4 | 7.8 | 1.1 | 6.7 | 1.3 | 3.8 | 0.5 | 3.2 | 0.5 |
| 320-322 | 52.4 | 68.4 | 55.4 | 108.8 | 12.8 | 45.2 | 8.5 | 1.5 | 7.7 | 1.2 | 7.4 | 1.4 | 4.2 | 0.5 | 3.4 | 0.5 |
| 322-324 | 52.7 | 61.4 | 59.4 | 116.4 | 13.8 | 46.6 | 8.2 | 1.6 | 8.3 | 1.4 | 7.5 | 1.4 | 4.0 | 0.6 | 3.5 | 0.5 |
| 324-326 | 50.6 | 67.7 | 55.4 | 111.4 | 13.3 | 46.4 | 8.5 | 1.5 | 7.6 | 1.2 | 6.7 | 1.3 | 3.6 | 0.5 | 3.6 | 0.5 |
| 326-328 | 51.3 | 67.1 | 50.5 | 107.2 | 12.7 | 46.3 | 8.1 | 1.7 | 6.5 | 1.1 | 6.3 | 1.2 | 3.5 | 0.6 | 3.4 | 0.5 |
| 328-330 | 50.4 | 65.3 | 49.6 | 99.0 | 11.9 | 43.6 | 7.7 | 1.3 | 7.2 | 1.1 | 6.4 | 1.3 | 3.6 | 0.5 | 3.2 | 0.5 |
| 330-332 | 50.1 | 73.5 | 48.1 | 99.4 | 12.1 | 40.6 | 7.8 | 1.4 | 7.0 | 1.1 | 6.1 | 1.3 | 3.3 | 0.5 | 3.2 | 0.4 |
| 332-334 | 50.7 | 66.2 | 50.8 | 97.5 | 11.2 | 43.4 | 7.5 | 1.3 | 7.4 | 1.0 | 6.2 | 1.2 | 3.4 | 0.5 | 3.2 | 0.5 |
| 334-336 | 52.6 | 69.0 | 49.6 | 98.0 | 11.7 | 42.6 | 8.2 | 1.5 | 7.5 | 1.1 | 6.5 | 1.2 | 3.6 | 0.5 | 3.3 | 0.5 |
| 336-338 | 50.7 | 67.0 | 49.9 | 98.2 | 11.7 | 43.3 | 8.1 | 1.6 | 7.4 | 1.2 | 6.0 | 1.3 | 3.4 | 0.5 | 3.4 | 0.5 |
| 338-340 | 50.8 | 62.5 | 49.0 | 102.6 | 12.6 | 42.8 | 7.9 | 1.6 | 7.1 | 1.1 | 6.5 | 1.3 | 3.9 | 0.6 | 3.0 | 0.5 |
| 340-342 | 53.1 | 63.6 | 46.3 | 92.0 | 11.0 | 39.8 | 7.6 | 1.3 | 6.2 | 1.0 | 6.0 | 1.1 | 3.5 | 0.5 | 3.0 | 0.5 |
| 342-344 | 56.5 | 63.6 | 49.4 | 100.9 | 12.3 | 44.5 | 7.7 | 1.4 | 7.2 | 1.1 | 6.5 | 1.2 | 3.4 | 0.5 | 3.0 | 0.5 |
| 344-346 | 54.7 | 62.7 | 48.3 | 98.8 | 11.9 | 44.5 | 8.1 | 1.5 | 7.3 | 1.1 | 6.5 | 1.3 | 3.4 | 0.5 | 3.4 | 0.5 |
| 346-360 | 37.5 | 58.3 | 33.5 | 63.5 | 7.8 | 28.2 | 5.7 | 1.1 | 4.2 | 0.7 | 3.8 | 0.8 | 2.2 | 0.3 | 2.1 | 0.3 |
| 360-370 | 40.6 | 73.1 | 48.0 | 100.0 | 11.9 | 42.5 | 7.6 | 1.4 | 6.7 | 1.0 | 5.5 | 1.1 | 3.4 | 0.5 | 3.1 | 0.5 |
| 370-380 | 40.0 | 75.4 | 43.6 | 90.8 | 11.1 | 37.3 | 6.7 | 1.4 | 6.0 | 1.0 | 5.1 | 1.1 | 3.0 | 0.4 | 2.9 | 0.5 |
| 380-390 | 32.0 | 69.7 | 39.8 | 78.7 | 9.5 | 34.6 | 6.8 | 1.4 | 6.5 | 0.9 | 5.5 | 1.0 | 2.9 | 0.4 | 2.7 | 0.4 |
| 390-400 | 28.1 | 64.0 | 34.9 | 70.3 | 8.5 | 30.6 | 5.9 | 1.0 | 5.3 | 0.8 | 4.3 | 0.8 | 2.5 | 0.3 | 2.4 | 0.3 |
| 400-410 | 33.5 | 66.9 | 36.1 | 73.3 | 9.0 | 33.4 | 6.1 | 1.2 | 6.4 | 0.8 | 5.2 | 1.0 | 3.0 | 0.4 | 2.8 | 0.4 |
| 410-420 | 33.4 | 64.2 | 34.5 | 68.3 | 8.2 | 32.7 | 6.0 | 1.0 | 4.7 | 0.8 | 4.9 | 1.0 | 2.7 | 0.4 | 2.7 | 0.4 |
| 420-430 | 42.5 | 78.8 | 46.4 | 91.5 | 10.9 | 39.6 | 7.3 | 1.4 | 6.2 | 1.1 | 6.0 | 1.1 | 3.3 | 0.5 | 3.1 | 0.5 |
| 430-440 | 40.3 | 68.3 | 42.9 | 82.4 | 9.8 | 36.2 | 6.7 | 1.2 | 6.0 | 0.9 | 5.5 | 1.1 | 2.9 | 0.5 | 2.8 | 0.4 |
| 440-450 | 41.2 | 77.0 | 46.1 | 90.1 | 10.7 | 38.0 | 7.6 | 1.4 | 6.2 | 1.0 | 6.1 | 1.2 | 3.3 | 0.5 | 2.8 | 0.5 |
| 450-460 | 38.5 | 73.6 | 41.9 | 82.8 | 9.9 | 37.5 | 7.6 | 1.4 | 6.5 | 1.0 | 5.8 | 1.1 | 3.4 | 0.5 | 3.0 | 0.5 |
| 460-473 | 36.6 | 69.3 | 40.1 | 77.9 | 9.5 | 34.9 | 6.5 | 1.3 | 6.1 | 0.9 | 5.1 | 1.0 | 3.1 | 0.5 | 3.1 | 0.4 |

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Table S2. Accumulation rate ($\text{g}\cdot\text{m}^{-2}\cdot\text{year}^{-1}$) of rare earth elements (REE) in the mud depositional succession (Master core4).

| Segment (cm) | ΣREE | Segment (cm) | ΣREE | Segment (cm) | ΣREE |
|--------------|--------------------|--------------|--------------------|--------------|--------------------|
| 3--6 | 12.00 | 118-120 | 20.81 | 232-234 | 1.72 |
| 6--8 | 12.38 | 120-122 | 15.85 | 234-236 | 1.87 |
| 8--10 | 12.12 | 122-124 | 18.21 | 236-238 | 1.80 |
| 10--12 | 11.50 | 124-126 | 18.65 | 238-240 | 1.43 |
| 12--14 | 10.49 | 126-128 | 14.92 | 240-242 | 1.87 |
| 14-16 | 12.19 | 128-130 | 13.48 | 242-244 | 1.13 |
| 16-18 | 20.32 | 130-132 | 12.04 | 244-246 | 1.23 |
| 18-20 | 25.17 | 132-134 | 12.91 | 246-248 | 1.26 |
| 20-22 | 19.82 | 134-136 | 16.50 | 248-250 | 1.48 |
| 22-24 | 9.44 | 136-138 | 15.57 | 250-252 | 1.52 |
| 24-26 | 9.35 | 138-140 | 14.89 | 252-254 | 1.74 |
| 26-28 | 13.31 | 140-142 | 19.51 | 254-256 | 1.16 |
| 28-30 | 17.73 | 142-144 | 20.90 | 256-258 | 1.59 |
| 30-32 | 15.76 | 144-146 | 28.16 | 258-260 | 1.54 |
| 32-34 | 15.26 | 146-148 | 20.03 | 260-262 | 1.82 |
| 34-36 | 14.47 | 148-150 | 17.32 | 262-264 | 1.79 |
| 36-38 | 18.85 | 150-152 | 12.18 | 264-266 | 1.39 |
| 38-40 | 14.96 | 152-154 | 14.52 | 266-268 | 1.57 |
| 40-42 | 15.57 | 154-156 | 23.20 | 268-270 | 1.74 |
| 42-44 | 11.35 | 156-158 | 24.62 | 270-272 | 1.21 |
| 44-46 | 10.38 | 158-160 | 8.14 | 272-274 | 1.21 |
| 46-48 | 19.96 | 160-162 | 15.33 | 274-276 | 1.76 |
| 48-50 | 23.95 | 162-164 | 20.02 | 276-278 | 1.94 |
| 50-52 | 20.53 | 164-166 | 21.21 | 278-280 | 1.73 |
| 52-54 | 11.04 | 166-168 | 15.35 | 280-282 | 1.51 |
| 54-56 | 12.96 | 168-170 | 13.56 | 282-284 | 1.16 |
| 56-58 | 19.00 | 170-172 | 19.76 | 284-286 | 1.47 |
| 58-60 | 17.38 | 172-174 | 20.94 | 286-288 | 1.49 |
| 60-62 | 20.72 | 174-176 | 24.09 | 288-290 | 1.67 |
| 62-64 | 10.86 | 176-178 | 6.89 | 290-292 | 1.35 |
| 64-66 | 8.48 | 178-180 | 5.21 | 292-294 | 1.59 |
| 66-68 | 15.81 | 180-182 | 6.34 | 294-296 | 1.77 |
| 68-70 | 14.65 | 182-184 | 2.50 | 296-298 | 1.45 |
| 70-72 | 15.33 | 184-186 | 2.11 | 298-300 | 1.26 |
| 72-74 | 12.59 | 186-188 | 1.56 | 300-302 | 1.63 |
| 74-76 | 15.72 | 188-190 | 1.41 | 302-304 | 1.60 |
| 76-78 | 13.14 | 190-192 | 1.66 | 304-306 | 1.67 |
| 78-80 | 12.63 | 192-194 | 1.72 | 306-308 | 1.21 |
| 80-82 | 19.20 | 194-196 | 1.73 | 308-310 | 1.64 |
| 82-84 | 18.65 | 196-198 | 1.79 | 310-312 | 1.39 |
| 84-86 | 21.32 | 198-200 | 1.83 | 312-314 | 1.19 |
| 86-88 | 11.83 | 200-202 | 1.60 | 314-316 | 1.48 |

| | | | | | |
|---------|-------|---------|------|---------|------|
| 88-90 | 11.22 | 202-204 | 1.48 | 316-318 | 1.52 |
| 90-92 | 20.03 | 204-206 | 1.45 | 318-320 | 1.36 |
| 92-94 | 20.95 | 206-208 | 1.50 | 320-322 | 1.46 |
| 94-96 | 21.19 | 208-210 | 1.46 | 322-324 | 1.26 |
| 96-98 | 18.41 | 210-212 | 1.69 | 324-326 | 1.51 |
| 98-100 | 21.01 | 212-214 | 1.48 | 326-328 | 1.59 |
| 100-102 | 19.40 | 214-216 | 1.48 | 328-330 | 1.48 |
| 102-104 | 17.88 | 216-218 | 1.19 | 330-332 | 1.42 |
| 104-106 | 17.87 | 218-220 | 1.68 | 332-334 | 1.15 |
| 106-108 | 10.09 | 220-222 | 1.56 | 334-336 | 1.42 |
| 108-110 | 11.85 | 222-224 | 1.27 | 336-338 | 1.43 |
| 110-112 | 21.35 | 224-226 | 1.23 | 338-340 | 1.41 |
| 112-114 | 22.17 | 226-228 | 1.65 | 340-342 | 1.24 |
| 114-116 | 18.70 | 228-230 | 1.68 | 342-344 | 1.29 |
| 116-118 | 23.23 | 230-232 | 1.18 | | |

Table S3. Concentrations of rare earth elements (REEs), Al and Fe extracted in each step of a 7-step sequential chemical extraction applied on 12 segments from the mud depositional succession. The uppermost eight samples are from the upper mud unit, and the four lowermost samples from the lower mud unit. The data of Fe (Yu et al., 2015) and Al (Yu et al., 2016) are from previous studies.

| Segment | Σ REE (mg/kg) | | | | | | |
|------------|-------------------------------------|--------|--------|--------|--------|--------|--------|
| | Sequential chemical extraction step | | | | | | |
| | Step 7 | Step 6 | Step 5 | Step 4 | Step 3 | Step 2 | Step 1 |
| 20-28 cm | 32.22 | 4.44 | 31.74 | 822.30 | 22.16 | 39.15 | 0.64 |
| 42-50 cm | 42.44 | 4.44 | 25.56 | 610.92 | 10.98 | 22.84 | 0.26 |
| 70-78 cm | 40.34 | 4.91 | 25.87 | 649.61 | 16.39 | 28.88 | 0.32 |
| 94-102 cm | 34.30 | 4.38 | 33.01 | 806.85 | 18.11 | 30.95 | 0.26 |
| 112-120 cm | 38.01 | 4.81 | 30.80 | 774.58 | 15.82 | 30.29 | 0.27 |
| 126-134 cm | 35.21 | 4.29 | 27.64 | 674.49 | 14.00 | 26.60 | 0.25 |
| 144-152 cm | 35.00 | 3.99 | 22.36 | 693.78 | 13.99 | 31.46 | 0.26 |
| 168-176 cm | 37.43 | 3.72 | 21.91 | 670.68 | 11.86 | 25.47 | 0.10 |
| 192-200 cm | 59.24 | 4.22 | 8.63 | 295.73 | 6.81 | 16.40 | 0.34 |
| 208-216 cm | 54.60 | 4.15 | 10.36 | 306.88 | 5.26 | 11.59 | 0.27 |
| 266-274 cm | 58.93 | 3.74 | 5.56 | 211.95 | 3.80 | 7.92 | 0.24 |
| 314-322 cm | 66.19 | 3.32 | 3.07 | 117.06 | 2.79 | 6.39 | 0.15 |

| Segment | Al (g/kg) | | | | | | |
|------------|-------------------------------------|--------|--------|--------|--------|--------|--------|
| | Sequential chemical extraction step | | | | | | |
| | Step 7 | Step 6 | Step 5 | Step 4 | Step 3 | Step 2 | Step 1 |
| 20-28 cm | 8.12 | 1.29 | 1.79 | 57.07 | 1.16 | 0.80 | 0.39 |
| 42-50 cm | 8.16 | 1.25 | 1.22 | 41.82 | 0.29 | 0.32 | 0.05 |
| 70-78 cm | 8.23 | 1.28 | 1.42 | 39.83 | 0.21 | 0.20 | 0.04 |
| 94-102 cm | 7.14 | 1.09 | 1.45 | 55.16 | 0.35 | 0.40 | 0.03 |
| 112-120 cm | 7.65 | 1.21 | 1.57 | 53.79 | 0.30 | 0.34 | 0.05 |
| 126-134 cm | 7.31 | 1.16 | 1.31 | 49.18 | 0.28 | 0.27 | 0.03 |
| 144-152 cm | 6.85 | 0.98 | 1.29 | 58.66 | 0.35 | 0.44 | 0.08 |
| 168-176 cm | 6.98 | 1.11 | 1.24 | 56.66 | 0.54 | 0.63 | 0.03 |
| 192-200 cm | 10.38 | 1.48 | 0.69 | 15.89 | 0.23 | 0.27 | 0.05 |
| 208-216 cm | 10.19 | 1.41 | 0.78 | 16.89 | 0.16 | 0.18 | 0.03 |
| 266-274 cm | 10.78 | 1.57 | 0.64 | 11.09 | 0.14 | 0.15 | 0.03 |
| 314-322 cm | 11.52 | 1.65 | 0.53 | 5.32 | 0.08 | 0.08 | 0.03 |

| Segment | Fe (g/kg) | | | | | | |
|------------|-------------------------------------|--------|--------|--------|--------|--------|--------|
| | Sequential chemical extraction step | | | | | | |
| | Step 7 | Step 6 | Step 5 | Step 4 | Step 3 | Step 2 | Step 1 |
| 20-28 cm | 9.55 | 2.63 | 2.05 | 16.13 | 1.97 | 3.40 | 1.64 |
| 42-50 cm | 10.23 | 6.07 | 2.22 | 15.48 | 1.27 | 2.48 | 1.39 |
| 70-78 cm | 10.80 | 2.49 | 3.07 | 17.95 | 3.50 | 4.14 | 1.78 |
| 94-102 cm | 9.47 | 2.12 | 2.68 | 17.85 | 3.11 | 4.67 | 2.48 |
| 112-120 cm | 10.10 | 2.67 | 2.84 | 18.09 | 2.56 | 4.03 | 2.42 |
| 126-134 cm | 9.72 | 2.19 | 2.75 | 17.08 | 2.80 | 4.40 | 2.49 |
| 144-152 cm | 9.37 | 2.04 | 2.45 | 17.10 | 2.03 | 4.04 | 2.22 |
| 168-176 cm | 9.45 | 2.16 | 2.33 | 13.62 | 1.85 | 3.73 | 2.33 |
| 192-200 cm | 14.28 | 2.86 | 3.32 | 13.63 | 3.18 | 5.36 | 1.59 |
| 208-216 cm | 13.62 | 3.39 | 3.52 | 18.22 | 4.58 | 3.95 | 1.45 |
| 266-274 cm | 14.66 | 2.95 | 3.78 | 14.68 | 4.14 | 4.53 | 1.30 |
| 314-322 cm | 15.51 | 2.87 | 3.11 | 16.87 | 3.70 | 6.52 | 1.71 |

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