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| Abstract |  |
| To fill the present gap in the national carbon accounting, this study was carried out to measure the soil organic carbon (SOC) stock and distribution over northern Canada's ecosystems. An analytical database of 382 soil profiles and 1376 horizons of SOC were compiled to represent the SOC stocks across northern Canada. In addition, to fill the data gaps of soil conditions in northern Canada, fieldwork collection of 60 soil profiles and 173 horizons as carried out to measure SOC and bulk density around Yellowknife (n~41) and Lupin (n~19) areas. The SOC storages to 1 m depth ranged from 1 to 74 kg C m-2 with an average of 35 kg C m-2 in Yellowknife and from 4 to 70 kg C m-2 with an average of 37 kg C m-2 in Lupin areas. Active layer to permafrost portioning of carbon storages varied, but an average SOC indicates an even partitioning of storages in both layers. The average horizon SOC density was highest in the L, F, & H horizons of 0.76 and 0.71 kg C m-2 cm-1 , then O horizons of 0.52 and 0.61 kg C m-2 cm-1 , then permafrost layers of 0.45 and 0.61 kg C m-2 cm-1 for both Yellowknife and Lupin areas, respectively. In the mineral horizons, average SOC concentrations ranged from 0.08 to 0.16 kg C m-2 cm-1 , decreasing with depth. The results of this study indicate the northern Canada's SOC pool size estimate is 1.5 times higher than the currently prepared literature database (24 kg C m-2). To provide strong confidence of SOC stock and its distribution, more site specific field measurements in relation with SOC and bulk density and biomass are emphasized for Canada's north. | |

**Please specify which Sustainable Development Goal (SDG) (s) falls under your research:**

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| Goal 1 | No Poverty | Goal 2 | Zero Hunger |
| Goal 3 | Good Health and Well-Being | Goal 4 | Quality Education |
| Goal 5 | Gender Equality | Goal 6 | Clean Water and Sanitation |
| Goal 7 | Affordable and Clean Energy | Goal 8 | Decent Work and Economic Growth |
| Goal 9 | Industry, Innovation and Infrastructure | Goal 10 | Reduced Inequalities |
| Goal 11 | Sustainable Cities and Communities | Goal 12 | Responsible Consumption and Production |
| **Goal 13** | **Climate Action** | Goal 14 | Life below Water |
| Goal 15 | Life on Land | Goal 16 | Peace, Justice and Strong Institutions |
| Goal 17 | Partnerships for the Goals |  |  |