Supplement of

Substantial stores of sedimentary carbon held in mid-latitude fjords

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**Supplementary Table 1.** Cross validation results

**Supplementary Figure.1.** Contour maps defining the topography of each seismic horizon.

**Supplementary Figure. 2 to 11.** Sediment core stratigraphies.

Additional Supporting Information (Files uploaded separately)

N/A

Introduction

The supplementary information includes one supplementary table and eleven supplementary figures.
Supplementary Table 1. Cross validation results (Residual $Z_{\text{mean}}$ & $Z_{\text{st.dev}}$) for the three basins of Loch Sunart.
Supplementary Figure 1 Contour maps defining the topography of each seismic horizon. (a) H4 sediment/water interface. (b) H3 intermediate post-glacial horizon. (c) H2 post-glacial/glacial interface (d) H1 basement.
Supplementary Figure. 2-11.

Sediment core stratigraphies displaying the sedimentary logs, seismic units and $^{14}$C dates.
### Core no.: GC009, Loch Sunart: 56 40.324°N  05 52.025°W, Depth: 107 m

| Log | Colour | Seismic Unit | Description | ¹⁴C Age |
|-----|--------|--------------|-------------|---------|
|     | 10YR 4/1 | U3 0-0.84m | 0-15 cm: Washed out (during coring) gravelly, shelly mud (large scallop-like bivalves)  | 140 cm 10801 ± 91 |
|     | 10YR 4/1 | U2 0.84-1.41m | 15-143 cm: Alternating layers/laminae of sandy, gravelly mud (dark grey: 10YR 4/1) with silty clayey mud (dark grey: 5Y 4/1) | |
|     | 5Y4/1 | | 6 cm large scallop shells 5 cm diam. gravel | |
| EOC | | | 3 cm diam. gravel | |

### Legend
- Clay
- Silt
- Sandy mud
- Muddy sand
- Sand
- Gravel
- Bivalve shell
- Snail shell
- Plant fragment
- Bioturbation degree (high/low)
### Core Specifications

**Core no.:** GC011, **Loch Sunart:** 56° 39.591’N  05° 58.178’W,  **Depth:** 91 m

### Sediment Logs

| Depth (cm) | Log | Colour | Seismic Unit | Description | 14C Age |
|------------|-----|--------|--------------|-------------|---------|
| 0          | 5Y3/1 | 5Y4/1 | U3 0.95-0.95m | Fine sandy mud, very dark grey  
Fine sandy mud with scattered shells, few wood pieces, dark grey, bioturbated | 60 cm  
2625 ± 66 |
| 10          | 10YR 4/1 |        | U3 0.95-2.29m | Shelly, gravelly sandy mud, many bivalves shells in lower part, many *Turitella* sp. shells in upper part, dark grey | 120 cm  
10878 ± 87 |
| 15          | 10YR 4/1 |        | U3 0.95-2.29m | Silty-sandy mud with scattered gravel and bivalve fragments | 170cm  
12760 ± 61 |
| 20          | 10YR 4/1 |        | U1 2.29-2.45m | Shelly, sandy mud, dark grey sharp | 231cm  
13658 ± 90 |
| 25          | EOC |        | | Silty clay, dark grey, soft | |

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**Core no.: GC013, Loch Sunart:** 56°40.879’N  05°37.771’W, **Depth:** 87 m

| Log | Colour | Seismic Unit | Description | \(^{14}C\) Age |
|-----|--------|--------------|-------------|----------------|
|     | 10YR3/2 | U3 0-0.998m | Silty sandy mud, Dark brown, firm. |                  |
| 50  | 10YR2/1 |              | Bioturbation 60-80cm                  |                  |
| 100 | 10YR3/2 | U2 0-1.67m  | Silt, dark grey olive, soft, slight smell | 113 cm 1294 ±35 |
| 150 | 5YR2.5/1 |             | Silt, dark brown with black dots, soft, scattered mm size gravel |                  |
|     | 5YR2.5/1 |             | Silt, dark brown, mm-size shell fragments |                  |
|     | EOC     |             | Silt, dark brown, bioturbation, pockets of mm size gravel |                  |
|     |         |             | Silt, dark brown, pockets of mm size gravel |                  |

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### Core no.: GC016, Loch Sunart: 56 40.857N 05 38.540W, Depth: 58m

| Log     | Colour | Seismic Unit | Description                                                                 | $^{14}$C Age |
|---------|--------|--------------|-----------------------------------------------------------------------------|--------------|
| 10YR3/2 | 10YR2/1| U3 0-0.56m   | Silty sandy mud, Dark brown, firm pockets of mm size gravel and mm-size shell fragments | 30 cm        |
|         |        |              | Bioturbation 30-40cm                                                        | 1438 ± 51    |
| EOC     | 10YR2/1|              | Silt, dark grey olive, soft                                                 |              |

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**Core no.: GC020, Loch Sunart: 56 42.257’N  05 45.080’W,  Depth: 105 m**

| Log   | Colour    | Seismic Unit | Description                                                                 | 14C Age |
|-------|-----------|--------------|------------------------------------------------------------------------------|---------|
| 5Y4/1 | 10YR4/1   | U3           | Sany shelly mud, dark grey olive, many bivalves sharp                        | 9 cm    |
|       |           | 10YR4/1      | Sandy silty mud, scattered gravel (max. 7 cm diam., dark greyish brown, few bivalves, bioturbated) | 19 cm   |
|       |           | U2 0-1.15m   | upward: gradual more sand content                                            | 126 cm  |
|       |           |              | Silty mud, dark greyish brown, bioturbated                                   | 13160 ± 90 |
|       |           |              | Sandy shelly, gravelly mud, dark grey olive, many bivalves                   |         |
|       |           |              | Silty mud, dark greyish brown, w. dark grey and reddish brown spots, bioturbated |         |

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- Bioturbation degree (high/low)
Core no.: GC022, Loch Sunart: 56 40.820 N’ 05 48.297 W, Depth: 120 m

| Log | Colour | Seismic Unit | Description | 14C Age |
|-----|--------|--------------|-------------|---------|
| 0   |        |              |             |         |
| 50  |        |              |             |         |
| 100 |        |              |             |         |
| 150 |        |              |             |         |
| 200 |        |              |             |         |
| 250 |        |              |             |         |
| 300 |        |              |             |         |

- **10YR4/2**: Homogenous silt, soft, water-rich. Grey/brown
- **10YR4/1**: Homogenous silt, compacted, drier. Grey
- **10YR5/2**: Fractured Shell 185cm (Mollusc)
- **7.5YR4/2**: Dried silt, compacted, drier. Grey
- **EOC**: EOC

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Core no.: GC023, Loch Sunart: 56 40.324°N 05 50.328°W, Depth: 110m

| Log | Colour | Seismic Unit | Description | ^14C Age |
|-----|--------|--------------|-------------|----------|
| 0   | 10YR4/1| U3 0-1.02m   | 0-70 cm: Silty sandy mud, dark grey/very dark grey, water-rich soft, H₂S smell, w. scattered mm-size shell fragments, bivalves, bioturbated | 30 cm 64 ± 51 |
| 50  | 10YR3/1| U2 1.02-2.89m | Very dark grey band (redox?) | 49 cm 788 ± 58 |
| 100 | 10YR4/1|             | Very dark grey band (redox?) | 58 cm 886 ± 55 |
| 272 | 5Y4/1  |             | 70-290 cm: Silty mud, dark grey olive, fairly soft, H₂S smell, scattered mm-size shell fragments, bivalves in lower part, bioturbated | 73 cm 1011 ± 66 |
| 315 |       |             | 173 cm: wood fragment | 111.5 cm 1274 ± 59 |
| 236 | 0-1.02m|             | 273 cm: wood fragment | 250 cm 1801 ± 80 |
| 236 | 1.02-2.89m|       | 286 cm: wood fragment | 286 cm 2099 ± 70 |

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Core no.: GC081, Loch Sunart: 56 40 139° N 05 51 797° W, Depth: 58 m

### Log

| Depth (cm) | Colour | Seismic Unit | Description | 14C Age |
|------------|--------|--------------|-------------|---------|
| 0          |        |              | Homogenous silt, soft, water-rich. Grey/brown |         |
| 50         |        |              |             |         |
| 100        |        |              | Homogenous silt, compacted, drier. Grey |         |
| 150        |        | U3 0.975-3.62m | Fractured Shell 152cm (Mollusc ?) |         |
| 200        | 10YR4/1|              | Homogenous silt, firm. Grey/olive |         |
| 250        |        | U2 0.975-3.62m | Bioturbation 242-254cm |         |
| 350        | 5YR4/1 |              |             |         |
| 400        |        |              |             |         |
| 450        | EOC    |              |             |         |

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### Core no.: GC-01, Loch Sunart: 56° 41.809’N  5° 42.299’W, Depth: 42 m

| Log | Colour | Seismic Unit | Description | ¹⁴C Age |
|-----|--------|--------------|-------------|---------|
| EOC | 10YR4/1 | U3 0-0.2m    | Silty sandy mud, dark grey/very dark grey water-rich, soft |         |

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| Log | Colour | Seismic Unit | Description | ¹⁴C Age |
|-----|--------|--------------|-------------|---------|
| 1050 | 10YR4/2 | U1 18-19.35m | Dry, heavily compacted. Glacial origin Brown/grey Cracking | |
| 1100 | 10YR4/2 | | Sand, course grain | 745 cm 17041 ± 312 |
| 1150 | 10YR4/2 | | Sand, course grain | |
| 1200 | 10YR4/2 | | Sandy mud, course grain | |
| 1250 | 10YR4/2 | | | |
| 1300 | 10YR4/2 | | | |
| 1350 | 10YR4/2 | | | |
| 1400 | 10YR4/2 | | | |
| 1450 | 10YR4/2 | | | |
| 1500 | 10YR4/2 | | | |
| 1550 | 10YR4/2 | | | |
| 1600 | 10YR4/2 | | | |
| 1650 | 10YR4/2 | | | |
| 1700 | 10YR4/2 | | | |
| 1750 | 10YR4/2 | | | |
| 1800 | 10YR4/2 | | | |
| 1850 | 10YR4/2 | | | |
| 1900 | 10YR4/2 | | | |
| 1950 | 10YR4/2 | | | |
| 2000 | 10YR4/2 | | | |
| 2050 | 10YR4/2 | | | |
| 2100 | 10YR4/2 | | | |

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