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1 Short Communication.

2 **Peatland initiation and carbon accumulation in the Falkland Islands.**

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10 **ABSTRACT**

11 The Falkland Islands in the South Atlantic Ocean contain extensive peatlands at the edge of their
12 global climatic envelope, but the long-term carbon dynamics of these sites is poorly quantified. We
13 present new data for ten sites, compile previously-published data and produce a new synthesis.
14 Many peatlands in the Falkland Islands developed notably early, with a fifth of basal ¹⁴C dates pre-
15 Holocene. Falkland Islands peats have high ash content, high carbon content and high bulk density
16 compared to global norms. In many sites carbon accumulation rates are extremely low, which may
17 partly relate to low average rainfall, or to carbon loss through burning and aeolian processes.
18 However, in coastal Tussac peatlands carbon accumulation can be extremely rapid. Our re-analysis
19 of published data from Beauchene Island, the southernmost of the Falkland Islands, yields an
20 exceptional long-term apparent carbon accumulation rate of 139 g C m⁻² yr⁻¹, to our knowledge the
21 highest recorded for any global peatland. This high accumulation may relate to the combination of a
22 long growing-season and marine nutrient inputs. Given extensive coverage and carbon-dense peats
23 the carbon stock of Falkland Islands peatlands is clearly considerable but robust quantification will
24 require the development of a reliable peat map. Falkland Island peatlands challenge many standard
25 assumptions and deserve more detailed study.

26 **KEYWORDS:** South Atlantic; Carbon accumulation; Bog; Peat; Holocene.

27 **HIGHLIGHTS:**

- 28 • The Falkland Islands contain extensive and poorly-understood peatlands.
29 • Peatlands are notably old with many pre-Holocene in age.
30 • Long-term carbon accumulation rate is very variable between sites.
31 • One site has the highest recorded carbon accumulation rate for any global peatland.
32 • These unusual peatlands deserve further study.

33

34 INTRODUCTION

35 Global peatlands currently store around 400-600 Gt of carbon and the long-term evolution of this
36 carbon pool has been an important focus for palaeoenvironmental research (Gorham, 1991;
37 MacDonald et al., 2006; Yu, 2012). The most extensive peatlands today are in the northern boreal
38 zone, in particular Western Siberia and the Hudson Bay Lowlands (Packalen et al., 2014; Sheng et al.,
39 2004), with other substantial areas in the humid tropics of equatorial Southeast Asia, Africa and
40 South America (Dargie et al., 2017; Page et al., 2011). Peatlands also occur in the high southern
41 latitudes of Australasia, Africa and South America with Yu et al. (2011) estimating the carbon stock of
42 these peatlands as 13-18 GtC. The largest proportion of this southern peatland carbon pool is
43 located in South America where peatlands developed early, have accumulated carbon at a notably
44 rapid rate and exist in a distinct climatic envelope (Loisel and Yu, 2013; Yu et al., 2011). Southern
45 hemisphere peatlands are generally under-researched and there is a clear imperative to improve
46 understanding, both in order to fill gaps in global databases and to understand carbon accumulation
47 in distinctive and unusual peat-forming environments.

48 The focus of this study is the Falkland Islands in the South Atlantic Ocean, located 500 km east of
49 mainland South America (~51°41'S, 59°10'W). Peatlands are extensive in the archipelago to the
50 extent that the Falkland Islands have been identified as having the highest proportional peat
51 coverage of any nation or territory (Joosten, 2010; McAdam, 2013). However, there are open
52 questions around whether these peatlands are continuing to accumulate carbon and how their
53 carbon stock has been affected by climate change and land management (Otley et al., 2008). The
54 peatland landscapes of the islands are unusual and varied, including some highly atypical peatland
55 habitats with very tall grasses and extensive influence from marine birds and mammals (McAdam,
56 2013; Smith and Karlsson, 2017). Prior to the first European settlement in the mid-18th century there
57 were no mammalian herbivores on the islands, and the introduction of extensive livestock grazing
58 has therefore led to major ecological change. Despite the presence of highly unusual peatland types,
59 their extensive area, widespread evidence of human-induced modification, and the status of the
60 islands as an Overseas Territory of the United Kingdom – which has considerable peat research
61 capacity – surprisingly little research has been conducted. The carbon stock, current greenhouse gas
62 balance, timing of peat development and rate of carbon accumulation in Falkland Island peatlands
63 are all largely unquantified. Here we present new data and a synthesis of the fragmentary existing
64 data in order to provide an initial assessment of peatland developmental history and long-term
65 carbon accumulation.

66 SITES AND METHODS

67 Our sampling focussed on East Falkland, the largest island containing the greatest peat area, and
68 aimed to sample a range of peatlands spanning much of the island (Table 1; Supplementary Fig. 2).
69 We sampled five sites with vegetation dominated by Whitegrass (*Cortaderia pilosa*); typically in
70 shallow basins, often with shallow peats. We sampled three sites with deeper peats and more varied
71 vegetation, including the shrub *Empetrum rubrum* ('Diddle Dee'), the monocot *Astelia pumila* and a
72 variety of graminoids, forbs and bryophytes. We sampled one coastal site with vegetation a near-
73 monoculture of Tussac grass (*Poa flabellata*). These coastal peatlands are relatively restricted in
74 distribution around the coastal fringe of the islands but have high above-ground carbon stocks and

75 can have deep peats (<11m)(Smith and Clymo, 1984; Smith and Karlsson, 2017). Finally, we sampled
76 one site in a valley system with closely-cropped graminoid vegetation (Table 1).

77 Cores were extracted from a representative location in each site using a Russian-pattern peat corer
78 (Aaby and Digerfeldt, 1986) and were subsampled in the field into 10 cm sections (Fig. 1). Additional
79 samples (c. 4 cm²) were taken from the interface of the lowermost peat and underlying sediment for
80 dating. In the laboratory, sample volumes were determined by water displacement and samples
81 oven dried at 105 °C to calculate dry bulk density (Chambers et al., 2011). Sub-samples were ground
82 and incinerated at 550 °C to calculate loss on ignition (LOI) and a subset of 91 samples (60%) spread
83 evenly across all the cores was analysed for carbon content using an Elementar Vario MACRO
84 elemental analyser with glutamic acid and peaty soil standards (Chambers et al., 2011). There was a
85 strong and significant linear relationship between loss on ignition and carbon content ($r=0.98$,
86 $p<0.001$) which was used to calculate carbon content for all samples without direct measurements
87 (Supplementary Fig. 3). Carbon density was calculated as the product of bulk density and measured
88 or modelled carbon content. Core carbon stock was calculated as the product of mean carbon
89 density and depth. Basal peat was disaggregated and inspected under low-powered microscopy
90 before being prepared for AMS ¹⁴C dating using an acid-base-acid protocol (Brock et al., 2016). For
91 four sites (SSX, SWI, ORQ, DPO [Table 1]) it was possible to identify macrofossils suitable for dating,
92 typically above-ground graminoid fragments. For the remaining six sites no suitable macrofossils
93 could be identified so we dated the humate fraction of bulk peat following the removal of roots
94 (Loisel et al., 2017; Shore et al., 1995). The resulting ¹⁴C dates were calibrated using the SHCal13
95 curve (Reimer et al., 2013) in Bchron (Parnell, 2016). The full-core long-term apparent rate of carbon
96 accumulation (here termed LARCA_{FC}) was calculated by dividing carbon stock by the calibrated basal
97 date. To account for the complexity of the calibrated radiocarbon age estimates we re-sampled the
98 individual probability distributions 1000 times and calculated LARCA_{FC} for each; we present results
99 on this basis as the mean and the 5th and 95th percentiles. We also calculated LARCA_{FC} for a
100 previously-published record from the edge of a raised coastal Tussac peatland on Beauchene Island
101 (Smith and Prince, 1985; Smith and Clymo, 1984). LARCA_{FC} was calculated for this record by
102 converting published wet to dry bulk density on the basis of moisture content, converting loss on
103 ignition to carbon content using the relationship derived in this study and interpolating between the
104 measured depths. To test the representativeness of the core dataset in terms of peat depth we
105 compared the dated core depths to a larger dataset of 805 depth measurements from 371 locations
106 in East Falkland (Supplementary Fig. 2). Depth measurements in this dataset were made using either
107 an avalanche probe or a soil corer, with a maximum recording depth of 2.5 m. This maximum depth
108 was determined by the logistics of the available equipment and means that the depth of some
109 deeper peats may be under-estimated. Measurements were typically made along transects at a
110 range of upland and lowland locations spanning peat/non-peat transitions. This dataset includes
111 variable numbers of measurements in each peatland so we calculated site mean depths and
112 compared these values to our dated core dataset using kernel density plots. The depth dataset is not
113 considered to be representative of the peatland areas as a whole, but is both considerably larger
114 than the core dataset and includes other areas of the island.

115 In parallel with our primary data collection we conducted a systematic search of the literature. We
116 compiled datasets of ¹⁴C dates representing peat initiation and individual site age-profiles and
117 calibrated these dates based on the SHCal13 curve (Reimer et al., 2013) in Bchron (Parnell, 2016).
118 Using both new and published basal peat radiocarbon dates we constructed a cumulative Summed

119 Probability Distribution (cSPD) to quantify the timing of peat initiation in the Falkland Islands (Reyes
120 and Cooke, 2011). To place these results in context we also constructed cSPDs for global and extra-
121 tropical South American peatlands based on the database of Treat et al. (2019). For each site
122 containing at least two dated depths we constructed a Bayesian age-depth model using Bacon with
123 default priors for accumulation rate and memory, accepting alternate suggestions where initial
124 screening suggested these were inappropriate (Blaauw and Christen, 2011; Goring et al., 2012). We
125 assigned the peat surface a calendar date based on the year of first data publication, unless peat was
126 overlain by other sediment.

127 Quantifying temporal change in carbon accumulation requires cores with data on carbon density and
128 adequate chronological control throughout the peat profile, which is currently available for very few
129 cores (Turney et al., 2016). However, several cores do have adequately constrained age-depth
130 models and this study presents data on carbon density for a substantial number of samples. In order
131 to use these data to make preliminary inferences about change in apparent carbon accumulation we
132 adopted the empirically-based framework of Ratcliffe et al. (2018) whereby age-depth models are
133 constructed for all available sites, levels are assigned carbon density values of an appropriate age
134 through multiple iterations of random re-selection, results are aggregated across cores and weighted
135 by age-depth model precision to produce an overall reconstruction. These results allow us to make
136 some initial inferences about potential temporal variability in carbon accumulation across the study
137 region.

138 **RESULTS AND DISCUSSION**

139 *Peatland initiation*

140 Basal peats in our study sites ranged in age from pre-Holocene (SWI) to late Holocene (WCR).
141 Combining our ten new dates with other basal dates from the literature gives a total dataset of thirty
142 peat initiation dates for the Falkland Islands. These suggest that peat formation began very early
143 with six sites showing pre-Holocene peat initiation, and the oldest sample thus-far published dated
144 at 13475 ± 50 BP (calibrated weighted mean: 16163 cal. BP) (Wilson et al., 2002). The oldest dates
145 are from the Lake Sullivan area of West Falkland (Wilson et al., 2002), but this is also the most
146 intensively-studied area and it is probable that similarly old peat is present in other locations. The
147 cSPD plots show that Falkland Island peatlands developed markedly earlier than the global norm, but
148 early peatland development is not unusual for South America (Fig. 3). While considerably older
149 peatlands are present around the world (Treat et al., 2019), many of these are in the tropics and
150 Falkland Islands peatlands are atypically old for the temperate/boreal realm. This may relate to the
151 limited extent of late Quaternary glaciation, which appears to have been restricted to cirques and
152 small mountain glaciers, particularly in West Falkland (Clapperton, 1971; Clapperton and Suggern,
153 1976; Roberts, 1984). The available stratigraphic evidence suggests that peat formation was
154 dominated by primary development and paludification with hydrosereal development seemingly not
155 common. Rates of peat initiation appear to have been relatively consistent from the early Holocene
156 to ~ 5 ka cal. BP but then slowed (Fig. 4). However, comparing the cores dated in this study to a larger
157 peat depth dataset from East Falkland suggests a bias towards deeper peats (Supplementary Fig. 4).
158 This may have skewed the sample towards older dates, although it is notable that even some sites
159 with shallow peat have early initiation dates (e.g. HOP) and comparison with the depth dataset is
160 complicated by definitional issues and the fact that some locations in the depth dataset exceeded

161 the maximum measurable depth. However representative they may be, our results demonstrate
162 that the Falkland Islands contain a surprising number of very old peatlands which stresses the
163 importance of including such under-studied regions in global datasets. Considerable work remains to
164 be done to assess the developmental history of South American peatlands and our combined
165 dataset expands the current radiocarbon data resource by almost 50%, albeit with a focus on a
166 single region.

167 *Peat properties*

168 The sedimentary properties of Falkland Islands peats differ from those of most global peatlands (Fig.
169 1; Fig. 2). Ash content in these samples was relatively high with only a small proportion of samples
170 having loss on ignition greater than 95% (15.2%), much less than the global mean (46%)(Fig. 2). Ash
171 content was highest in SWI with sediments barely classifiable as peat (mean loss on ignition: 34%).
172 Inorganic contents were comparatively high even in clearly ombrotrophic sites (e.g. SSX), suggesting
173 that mineral dust transport in the very windy Falkland Islands climate may be the dominant reason
174 for this high ash content. The nature of the inorganic component has not been investigated in detail
175 but is likely to derive from both local aeolian processes and further-travelled mineral dust, with
176 tephra from mainland South America also recorded as highly abundant in Falkland Islands peats
177 (Holmes et al., 1999; Monteath et al., 2019). Peat bulk density and carbon content were high relative
178 to global norms (Fig. 2). In the case of carbon content this may relate to the comparative rarity of
179 *Sphagnum* in Falkland Island peatlands as *Sphagnum* peats skew carbon content towards lower
180 values in global data (Loisel et al., 2014). The relatively high bulk density may be due to a
181 combination of this relative scarcity of *Sphagnum*, high ash content and the highly humified nature
182 of many peats. The combination of high bulk density and high carbon content means that the carbon
183 density of peat also tends towards the upper end of the global range. Collectively these data
184 demonstrate the importance of region-specific datasets in understanding peatland carbon stocks
185 and dynamics; global average values would not be appropriate for Falkland Islands peats.

186 *Carbon accumulation rate*

187 Long-term rates of carbon accumulation were highly variable between sites with LARCA_{FC} ranging
188 from 2.6 to 32 g C m⁻² yr⁻¹. Rates were lowest in the valley and Whitegrass dominated sites, higher in
189 the Diddle Dee sites and highest in the Tussac site: Cape Dolphin. However, for the Tussac peatland
190 on Beauchene Island investigated by Smith and Clymo (1984) we calculated an exceptionally high
191 LARCA_{FC} of 139 g C m⁻² yr⁻¹. This is more than six times the global mean accumulation rate (Loisel et
192 al., 2014) and more than 50% higher than the highest published LARCA figure of which we are aware
193 (88.6 g C m⁻² yr⁻¹; Tolonen and Turunen (1996)). Carbon accumulation in this site appears to be the
194 highest documented in any global peatland and was justifiably termed 'extraordinary' by the original
195 authors. While the peat accumulation rate and depth of this site are towards the upper end of the
196 global distribution, the high rate of carbon accumulation is primarily attributable to the extremely
197 high bulk density of the peat. Older data often needs to be treated with caution but it is notable that
198 the original authors went to considerable efforts to validate their bulk density measurements and
199 the chronology is plausible; there is currently little reason not to accept this as a valid result,
200 although further validation would clearly be desirable.

201 Falkland Islands peats appear to encompass a very large range of accumulation rates. In the majority
202 of sites LARCA_{FC} was low to very low. Our data do not allow us to assess whether this is because of

203 low initial carbon accumulation or subsequent carbon loss, but active peat erosion is clearly a
204 feature of the Falklands peatlands landscape. Erosion features are widely visible and in two cores
205 from West Falkland, Wilson et al. (2002) dated the upper surface of eroding peats to 13040 ± 50 BP
206 and 13080 ± 60 BP respectively. It is also clear that fire has had a long-term role in Falkland peatland
207 carbon dynamics with macrofossil charcoal highly abundant in peat cores (Mauquoy, unpublished
208 data). It is likely that factors such as natural and anthropogenic burning, overgrazing and aeolian
209 erosion are at least part of the reason for the low rates observed in many sites.

210 The reasons for the extremely rapid carbon accumulation rates in the Tussac sites are similarly
211 unclear. The Falklands are at the edge of the climatic envelope for global peatlands being relatively
212 dry for their mild temperature, with mean annual precipitation around 600mm and mean annual
213 temperature of around 6°C (Supplementary Fig. 5;6). The climate regime has a high degree of
214 seasonal consistency in precipitation and relatively mild, relatively consistent temperature which
215 may allow for a long growing season (Supplementary Fig. 7). This is similar to Patagonia where high
216 carbon accumulation has been attributed to similar climatic conditions in – otherwise quite different
217 – peatlands (Loisel and Yu, 2013). However, all Falkland Island peatlands experience a broadly similar
218 climate and the distinguishing feature of Tussac sites is their coastal location. In these locations
219 marine birds and mammals are likely to be a significant vector for nutrients as they shelter on or
220 amongst the large grass tussocks. The biogeochemistry of these highly unusual sites would clearly
221 repay further detailed study.

222 *Variability in apparent carbon accumulation*

223 Two features are apparent in our carbon accumulation simulations (Fig. 4): an increase in peat and
224 carbon accumulation in the late Holocene (last ~2ka) and, less clearly, an increase in carbon
225 accumulation between 7.5 and 9.5ka cal. BP. The latter is based on a relatively limited number of
226 cores and samples but is interesting as it parallels previous reconstructions from cores around the
227 world and often attributed to the Holocene Thermal Maximum (HTM)(Loisel et al., 2014; Ratcliffe et
228 al., 2018). The only previously published peatland carbon accumulation reconstruction does not
229 extend back sufficiently far to address changes in this period (Turney et al., 2016). The Falklands
230 climate is dominated by Westerly winds (Jones et al., 2016) and reduced wind speeds in the
231 Southern Westerly belt have been reconstructed for the HTM (Saunders et al., 2018). Due to the
232 position of the Falkland Islands in the lee of the Andean mountain chain, this may have led to
233 enhanced precipitation on the Falkland Islands during this time interval given the negative
234 correlation between 850-hPa zonal wind speed strength and precipitation in eastern Patagonia
235 (Garreaud et al., 2013). In a previous Falkland Islands study Turney et al. (2016) attributed an
236 increase in carbon accumulation at the top of their cores, similar to that we reconstruct, to recent
237 climate change. However, this conclusion is unsafe because cores will inevitably show an increase in
238 *apparent* carbon accumulation simply due to the transition to acrotelm peat which has not yet had
239 the opportunity to decompose. This ‘near-surface uptick’ is widely reported and can be expected in
240 all peat cores (Loisel et al., 2014). The result here should be considered an artefact pending
241 compelling evidence to the contrary.

242 *Carbon stock*

243 There is currently no established peat map for the Falkland Islands, which makes it impossible to
244 accurately calculate the total carbon stock. A recent assessment by Evans et al. (2019) combined the

245 peat depth survey described in this study with previous superficial deposit mapping by the British
246 Geological Survey (Aldiss and Edwards, 1999) to produce an indicative estimate that 2820 km² ha of
247 the Falkand Islands (around one quarter of the total land area) is peat covered, noting that this
248 estimate is highly uncertain. If we combine this estimate with the measured carbon densities
249 obtained from our cores plus those of Smith and Prince (1985) (mean= 0.073 g C cm⁻³), and take our
250 depth dataset as representative of peat depth (mean= 76cm), the total C stock would be 156 MtC.
251 This approximate figure may be conservative (for example because peat depths > 2.5 m were not
252 captured in the survey) but is, for instance, equivalent to more than 12,000 times the emissions
253 associated with all annual energy consumption on the islands (2009 data: (iMC Worldwide, 2012))
254 and considerably greater than a published assessment of the peatland carbon stock of Wales (~121
255 MtC)(ECOSSE, 2007). Mapping of Falkland Islands peats is now underway which should allow this
256 estimate to be better-constrained in the future.

257

258 **ACKNOWLEDGEMENTS**

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265 the first field campaign, and we would like to thank Ben Berntsen at Elephant Beach Farm for sharing
266 his time and knowledge. Thanks to Frin Ross and David Large for valuable discussions about Falkland
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268 Author contributions: RJP and CE secured funding. RJP, GR and CE conducted fieldwork. FR-H, DM,
269 RJP and TS conducted laboratory work. FR-H and RJP conducted data compilation and RJP conducted
270 data analysis. RJP wrote the first draft of the manuscript, to which all authors contributed with
271 comments and interpretation.

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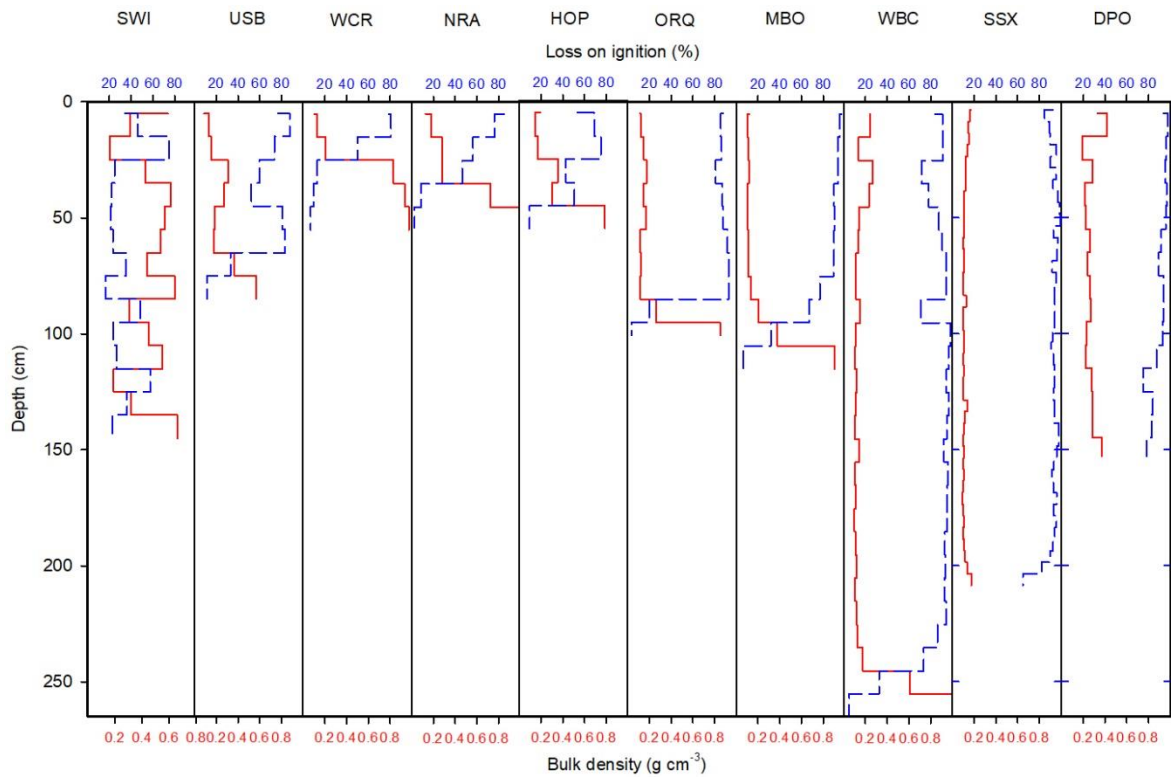
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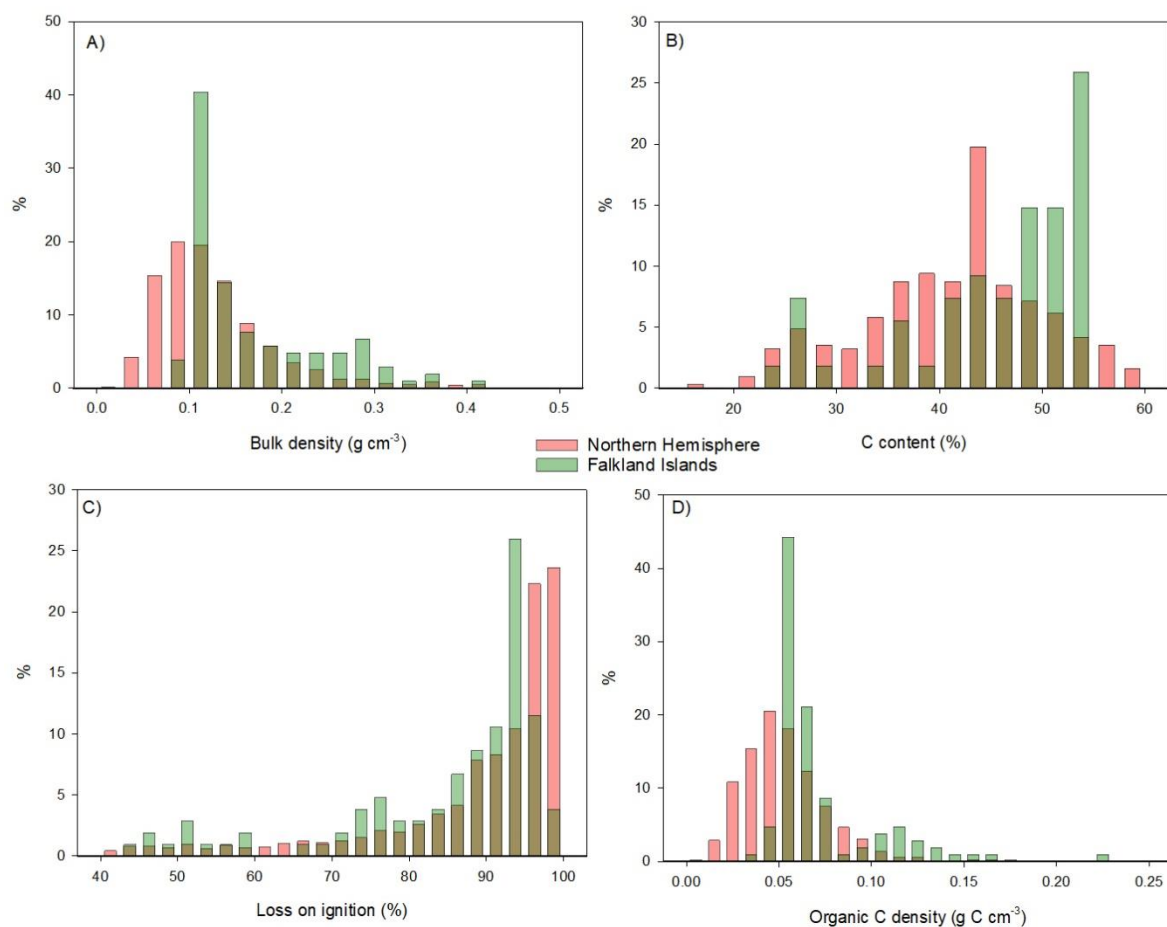
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287 Figure 1. Bulk density (red, solid line) and loss on ignition (blue, dashed line) profiles for the ten peat
288 cores presented in this study.

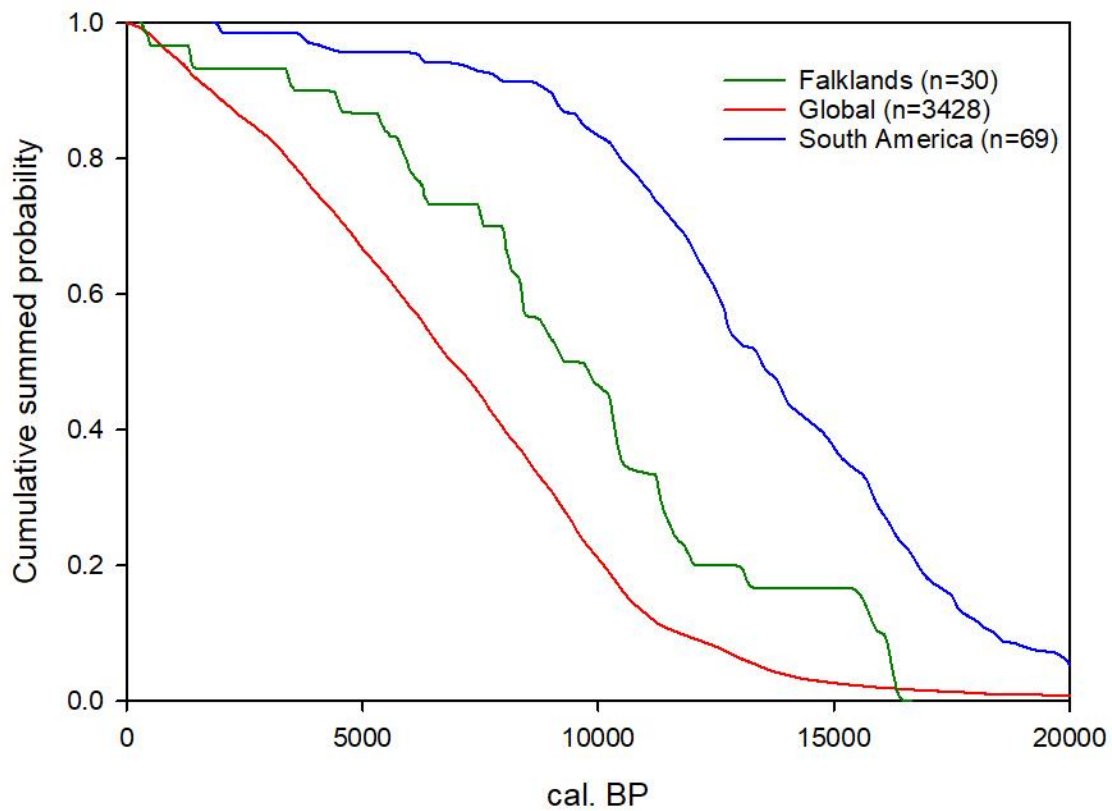


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291 Figure 2. Comparison of peat properties from sites sampled here to the Northern Hemisphere
 292 dataset of Loisel et al. (2014). To avoid over-representing results from cores sampled at high
 293 resolution, all cores were reduced to 10cm increment means. Samples with LOI<40% or BD>0.5g cm⁻³
 294 were excluded.

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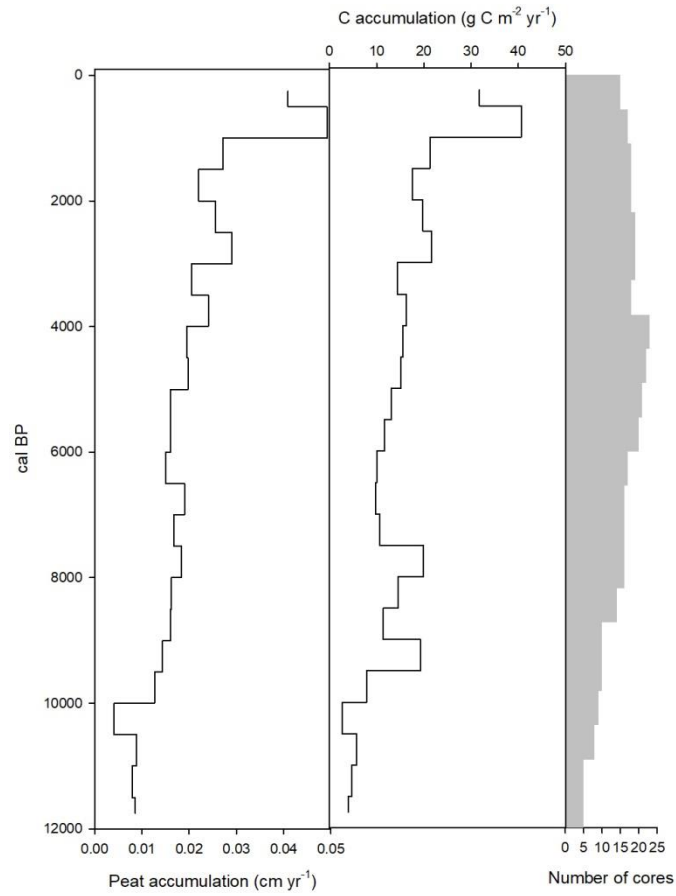


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299 Figure 3. Cumulative summed probability distribution plot of peat initiation ¹⁴C dates for Falkland
 300 Island peatlands (this study) compared to previously-presented datasets for global peat and extra-
 301 tropical South America(Treat et al., 2019).

302



303

304

305 Figure 4. Inferred peat and carbon accumulation in Falkland Island peatlands, based on available
 306 data: a) aggregated peat accumulation rate across all sites; b) simulated carbon accumulation; c)
 307 number of dated core records contributing to the results.

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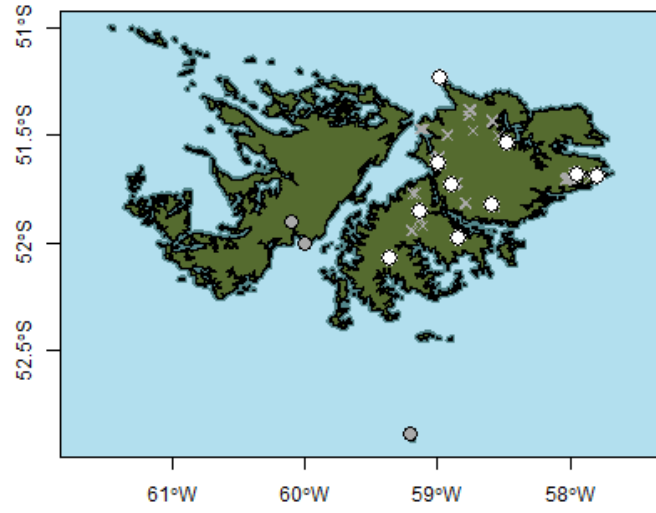
Table 1. Details of sites, basal dates, peat depth and (full-core) long-term apparent rate of carbon accumulation (LARCA_{FC}) for sites in this study.

Site details				Basal ¹⁴ C date			Depth (cm)	LARCA _{FC} (g C m ⁻² yr ⁻¹)		
Name	Code	S	W	Code	BP	Error		Mean	5 th	95 th
<i>Valley fen</i>										
Swan Inlet	SWI	-51.82	-58.59	D-AMS-029687	13516	60	145	5.21	5.18	5.25
<i>Whitegrass</i>										
Mt. Usborne	USB	-51.73	-58.89	D-AMS-030520	10002	47	70	4.07	4	4.11
Walker Creek	WCR	-51.98	-58.84	D-AMS-030519	1520	34	34	12.08	11.62	12.48
North Arm	NRA	-52.07	-59.36	D-AMS-030518	6657	42	47	4.02	3.99	4.06
Hope Cottage	HOP	-51.54	-58.48	D-AMS-030521	9924	47	50	2.65	2.62	2.66
Orqueta	ORQ	-51.85	-59.13	D-AMS-029690	4740	42	97	10.8	10.54	11
<i>Diddle dee</i>										
Moody Brook	MBO	-51.69	-57.95	D-AMS-030516	7277	38	105	7.13	7.05	7.2
Whalebone Cove	WBC	-51.69	-57.80	D-AMS-030517	8041	46	255	19	18.73	19.34
Sussex Mountains	SSX	-51.63	-59.00	D-AMS-029686	10089	42	210	10.67	10.51	10.83
<i>Tussac</i>										
Cape Dolphin	DPO	-51.24	-58.99	D-AMS-029694	5542	45	156	32.18	31.76	32.6

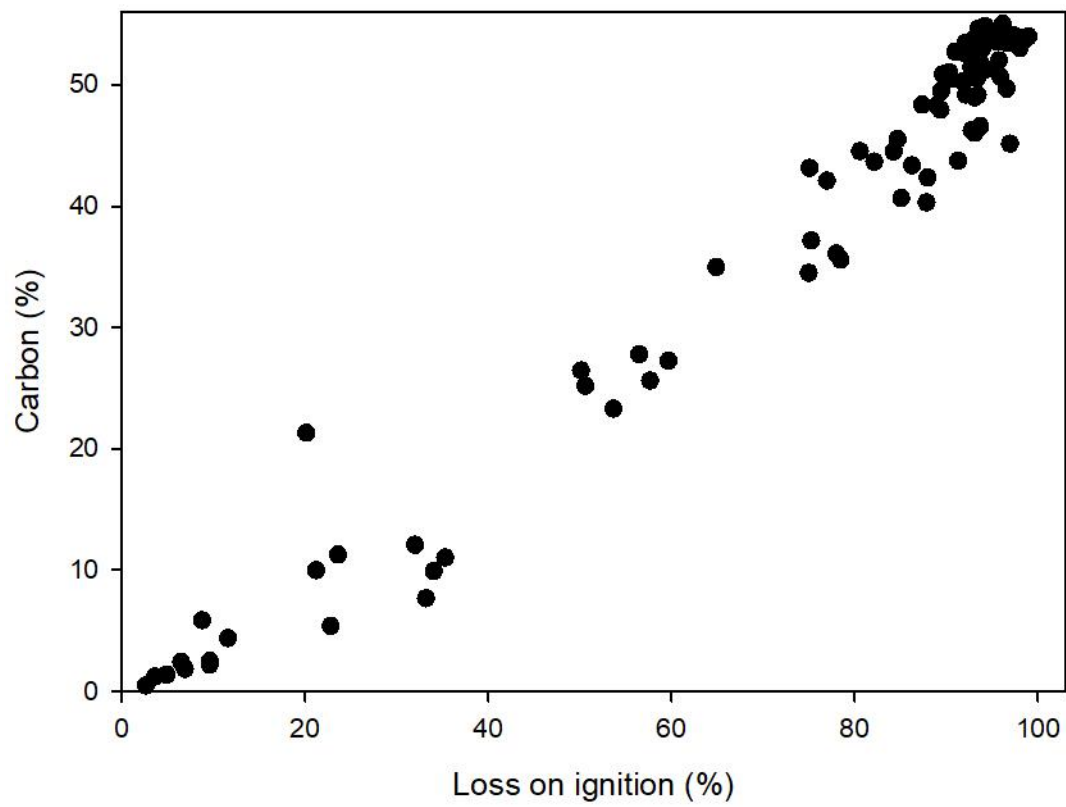
SUPPLEMENTARY FIGURES AND TABLES



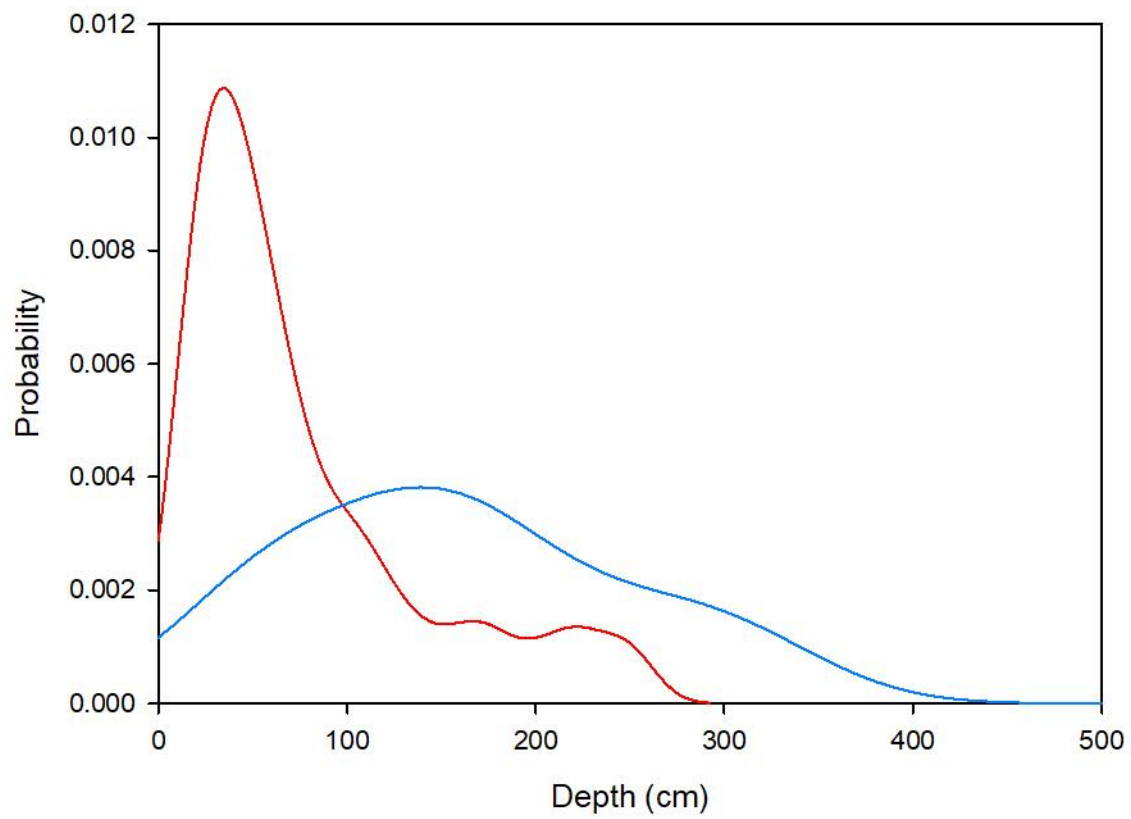
Supplementary Figure 1. Selected images of study sites, demonstrating different types of Falkland Island peatlands: A) Cape Dolphin (Tussac); B) Hope Cottage (Whitegrass); C) Whalebone Cove (Diddle Dee); D) Swan Inlet (Valley).



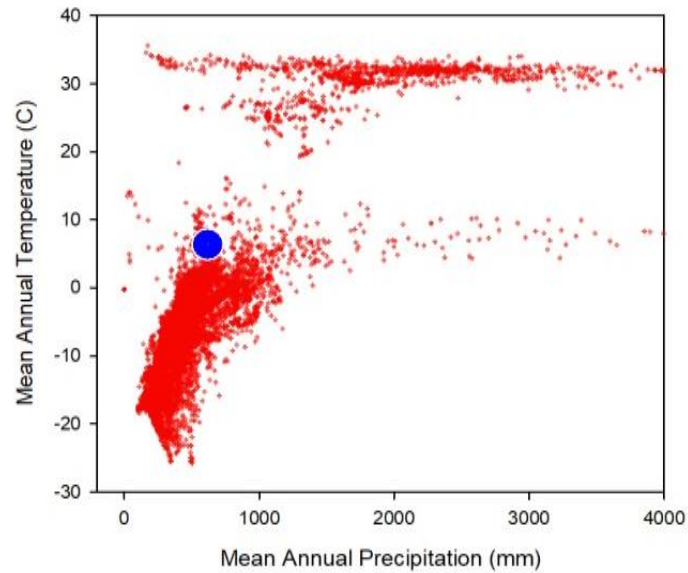
Supplementary Figure 2. Locations of sites considered in this study. Sites of new coring shown by white circles, previously studied coring sites shown by grey circles and sites of depth measurements shown by crosses.



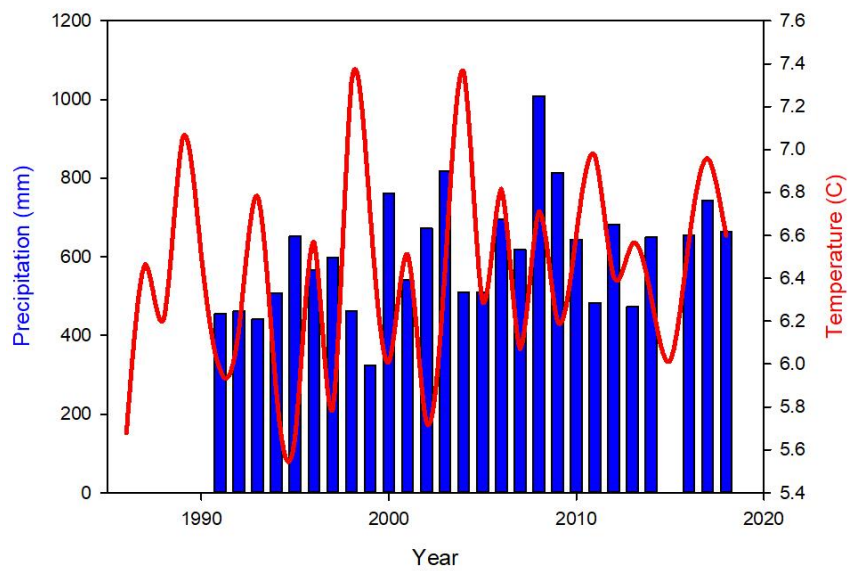
Supplementary Figure 3. Loss on ignition versus carbon content for Falkland Islands peat samples analysed in this study.



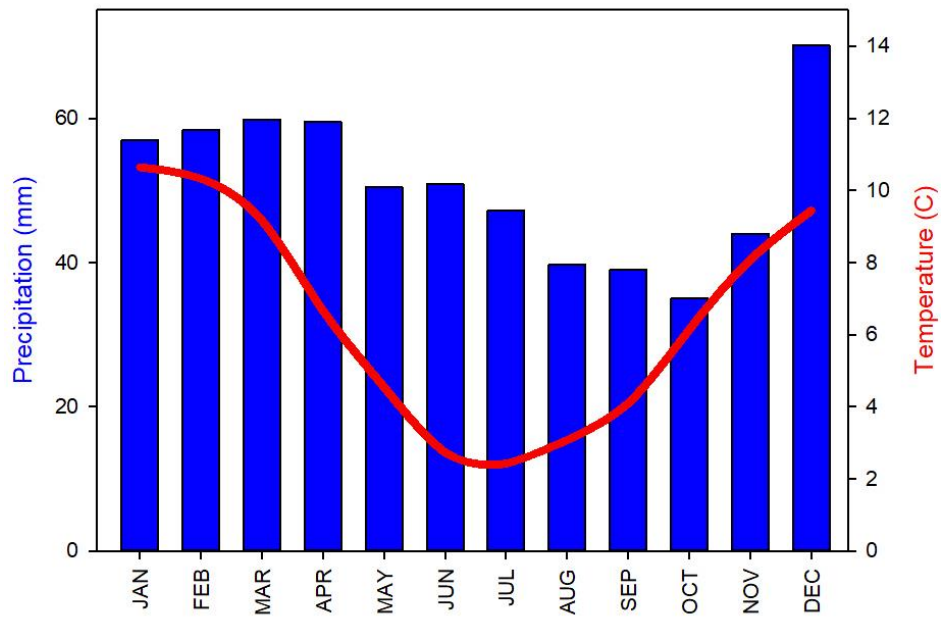
Supplementary Figure 4. Kernel density plot comparing total depths of dated cores (blue) to depths derived from a larger dataset of depth measurements from across East Falkland (red). See text for caveats on data quality and comparability.



Supplementary Figure 5. Climate space of global peatlands and the Falkland Islands. Red dots show 10,000 randomly positioned points on the global peat map of Yu et al. (2010) with mean annual temperature and precipitation data extracted from the database of Hijmans et al. (2005). Blue dot shows meteorological data for RAF Mountain Pleasant in central East Falkland (close to the SWI site) for the period 1985-2018. The bimodal temperature distribution of global peatlands represents the distinct climate spaces of tropical and temperate/high-latitude peatlands.



Supplementary Figure 6. Inter-annual change in precipitation and temperature (Station: RAF Mount Pleasant, 1985-2018).



Supplementary Figure 7. Annual variability in precipitation and temperature (Station: RAF Mount Pleasant, 1985-2018).

DATA AVAILABILITY

Data underlying this study are available at: [URL to be added on acceptance]

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