Peatland restoration

Sphagnum, carbon and timescales

Richard Lindsay

University of East London
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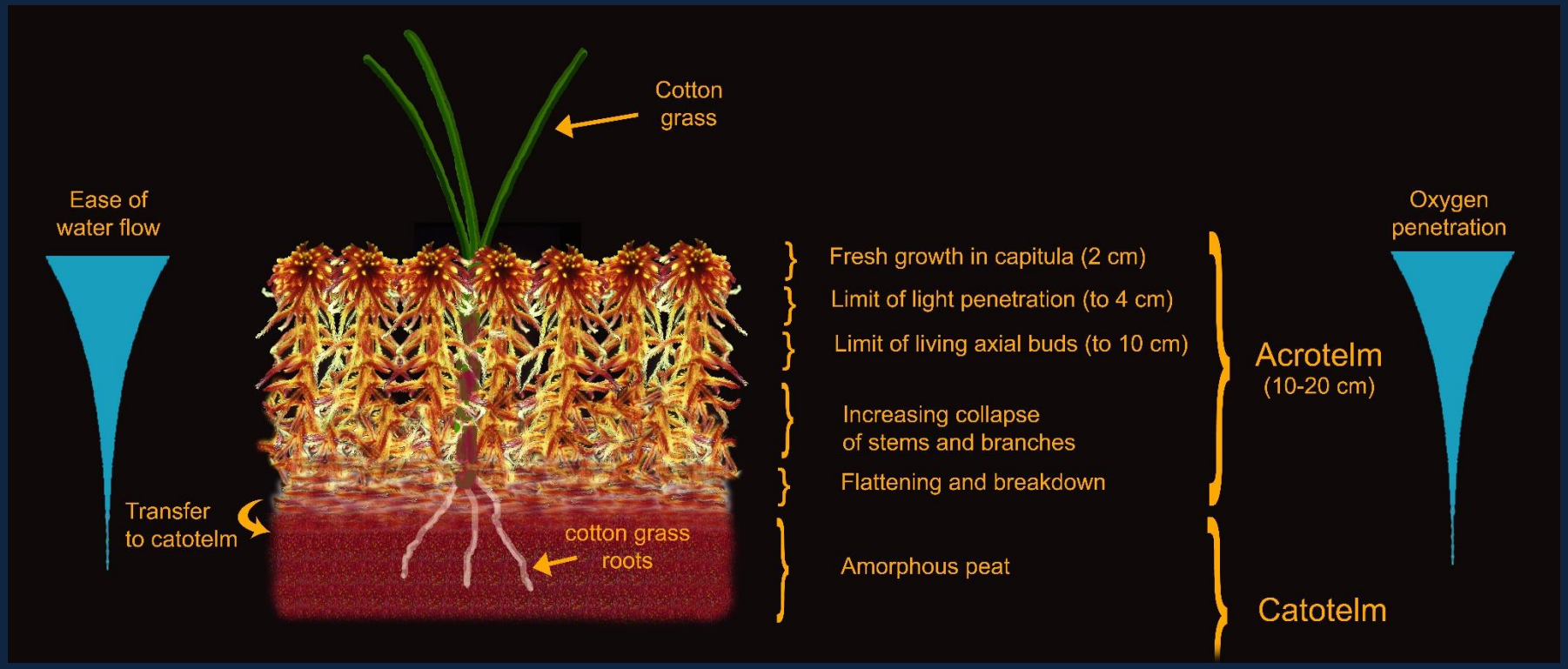
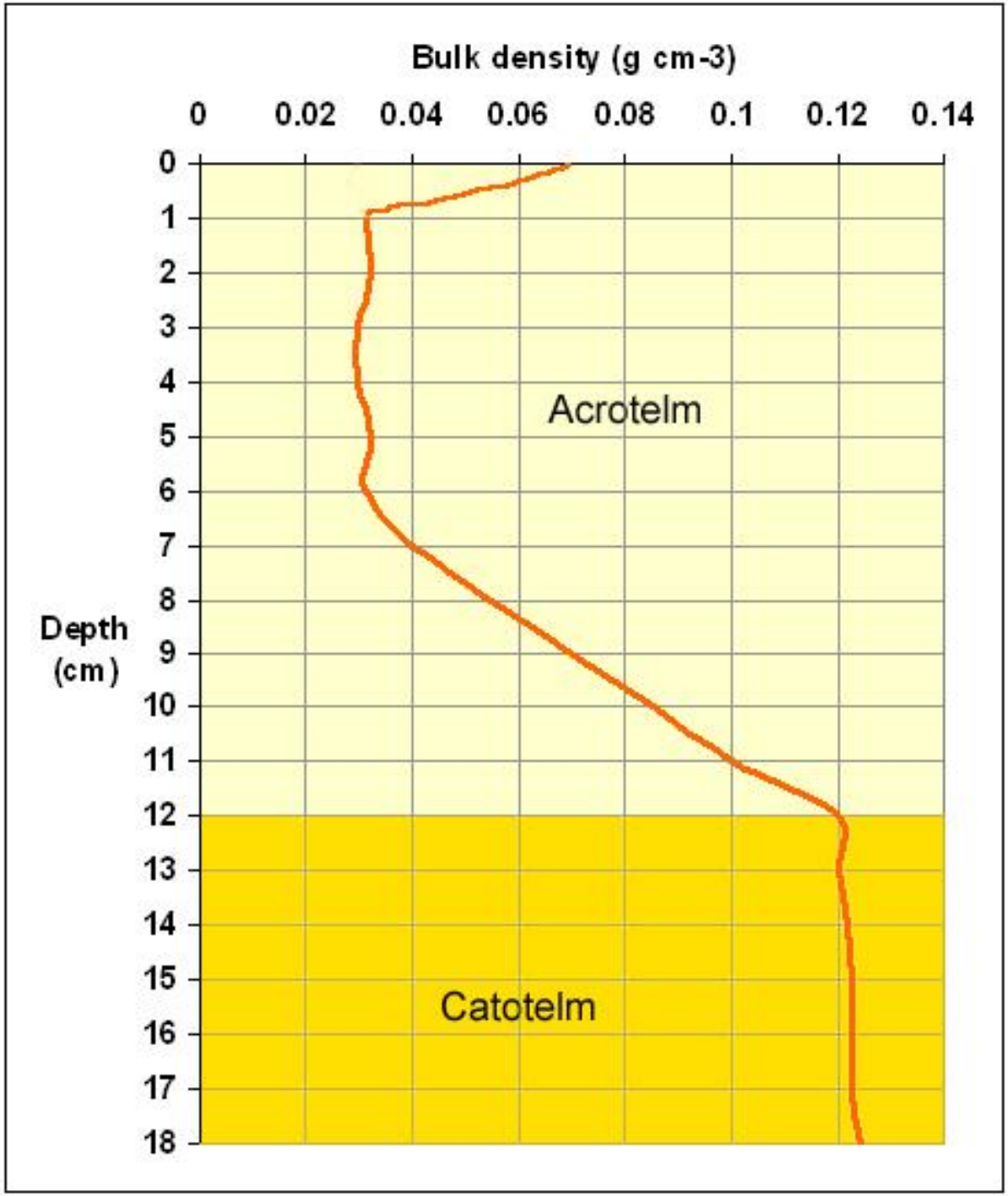
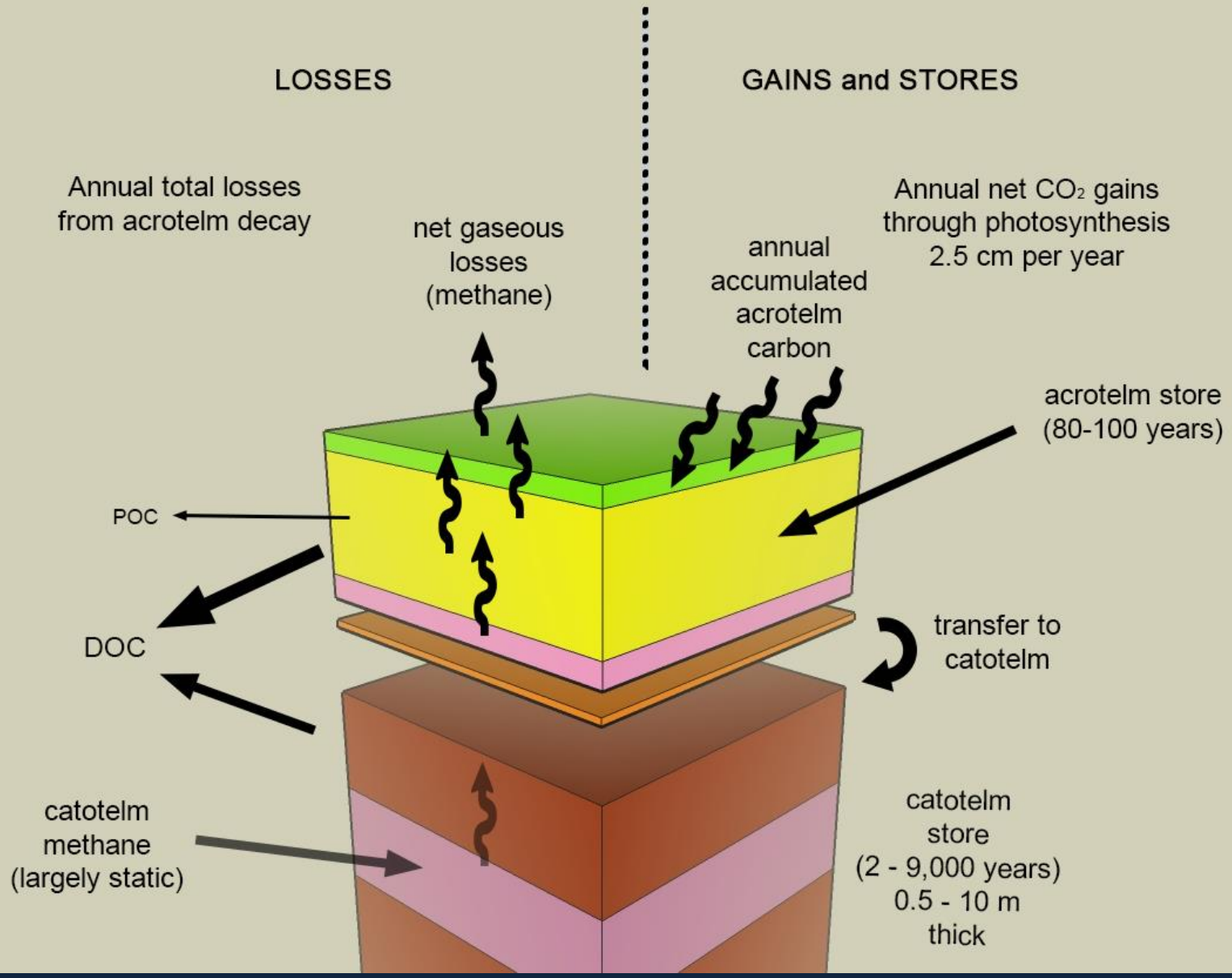

Cotton grass
Ease of water flow
Oxygen penetration
Fresh growth in capitula (2 cm)
Limit of light penetration (to 4 cm)
Limit of living axial buds (to 10 cm)
Increasing collapse of stems and branches
Flattening and breakdown
Acrotelm (10-20 cm)
Transfer to catotelm
cotton grass roots
Amorphous peat
Catotelm


Bulk density (g cm-3)
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
Depth (cm)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
Acrotelm
Catotelm


LOSSES
GAINS and STORES
Annual total losses from acrotelm decay
net gaseous losses (methane)
annual accumulated acrotelm carbon
Annual net CO_2 gains through photosynthesis 2.5 cm per year
acrotelm store (80-100 years)
POC
DOC
transfer to catotelm
catotelm methane (largely static)
catotelm store (2 - 9,000 years) 0.5 - 10 m thick

Ecosystems (2007) 10: 890–905
DOI: 10.1007/s10021-007-9067-2

ECOSYSTEMS

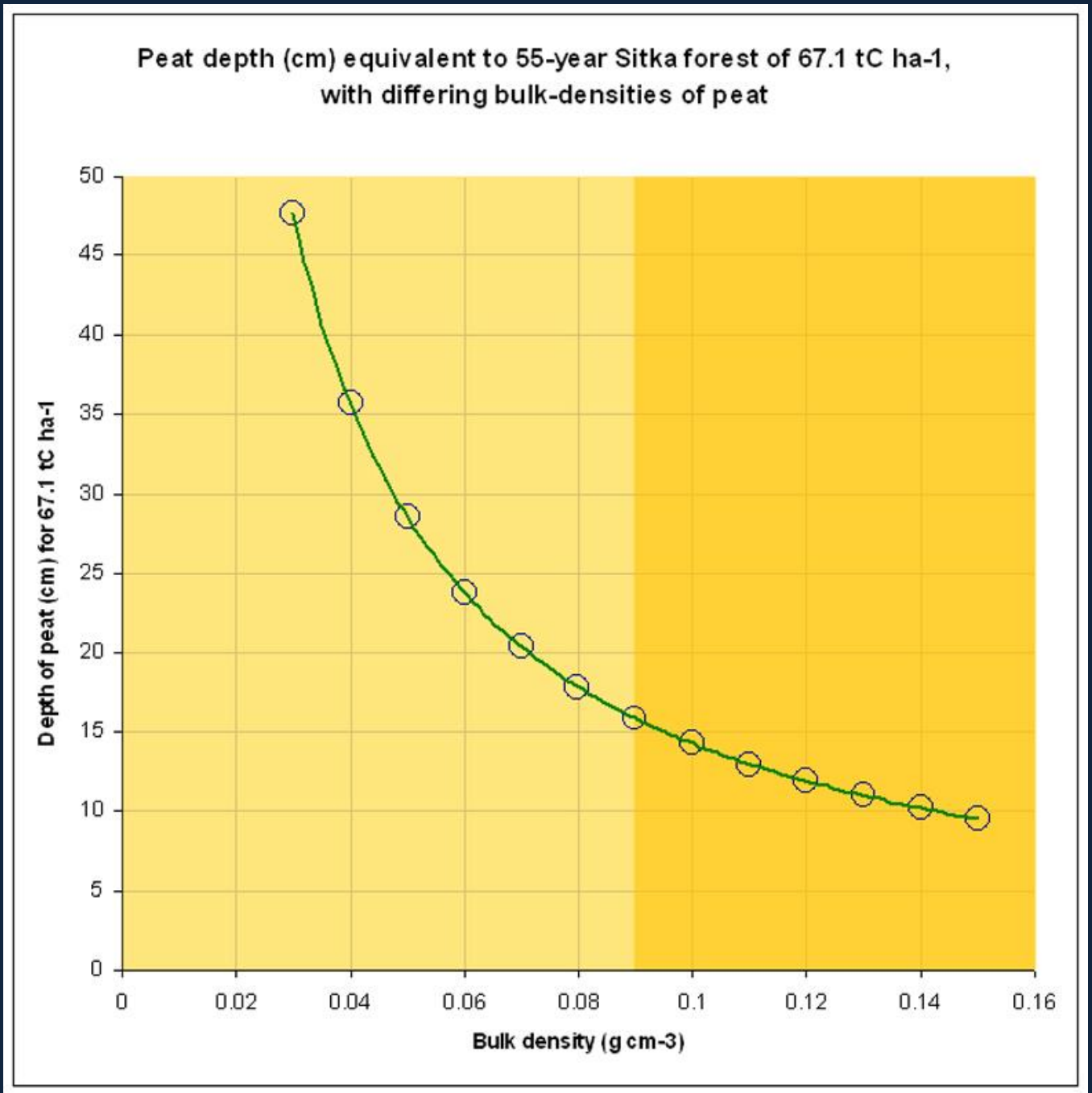
Patterns in Vegetation and CO_2 Dynamics along a Water Level Gradient in a Lowland Blanket Bog

Anna Laine,[1,*] Kenneth A. Byrne,[1] Gerard Kiely,[1] and Eeva-Stiina Tuittila[2]

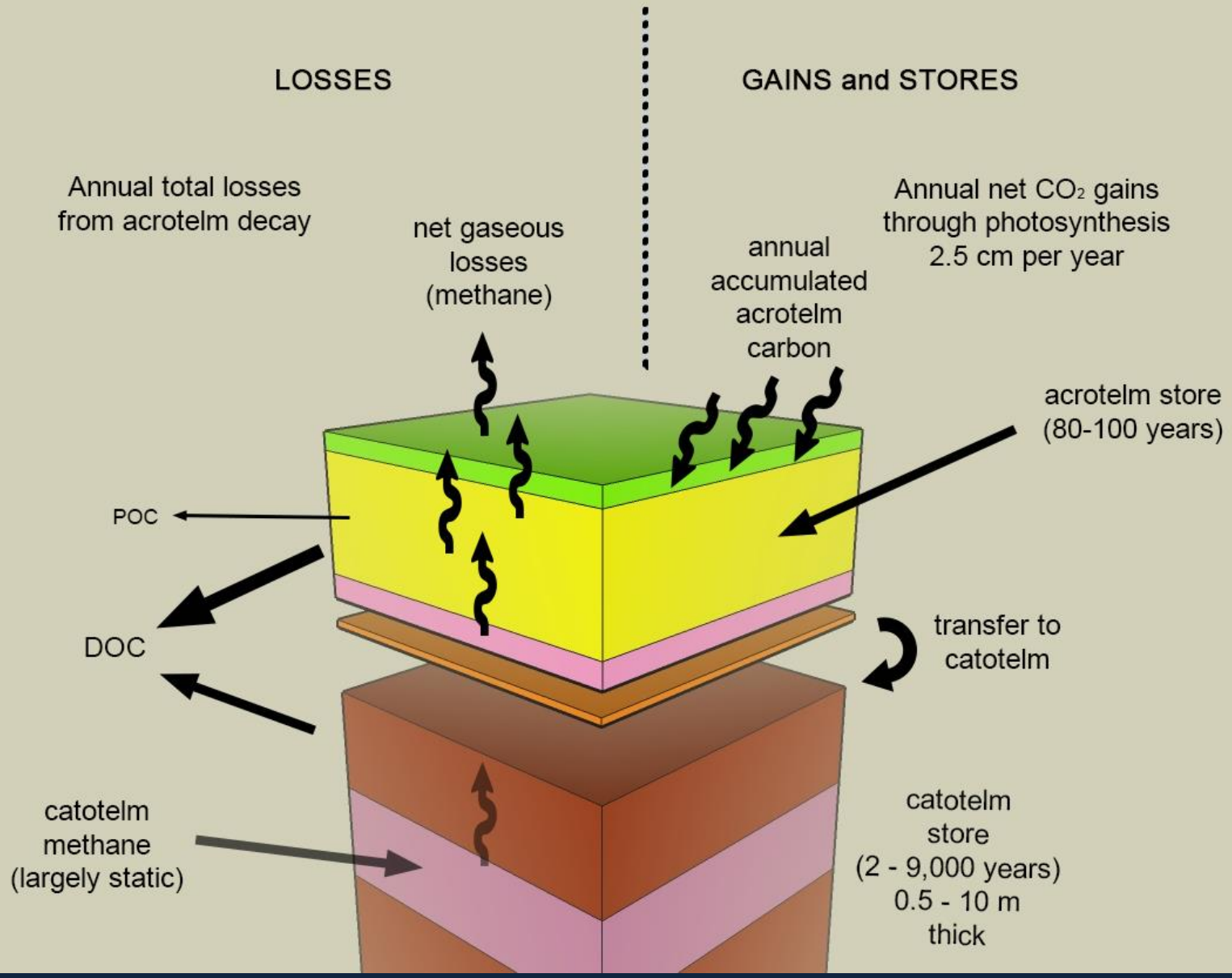
[1]*Department of Civil and Environmental Engineering, University College Cork, Cork, Ireland;* [2]*Department of Forest Ecology, University of Helsinki, Helsinki, Finland*

Laine et al (2007) recorded
209 g C m^{-2} yr^{-1}
at -11 cm water table

…which is equivalent to
2 t C ha^{-1} yr^{-1}
assuming a DBD of 0.04 g cm^{-3}



This sitka plantation has accumulated at a rate of 1.22 t C ha^{-1} yr^{-1}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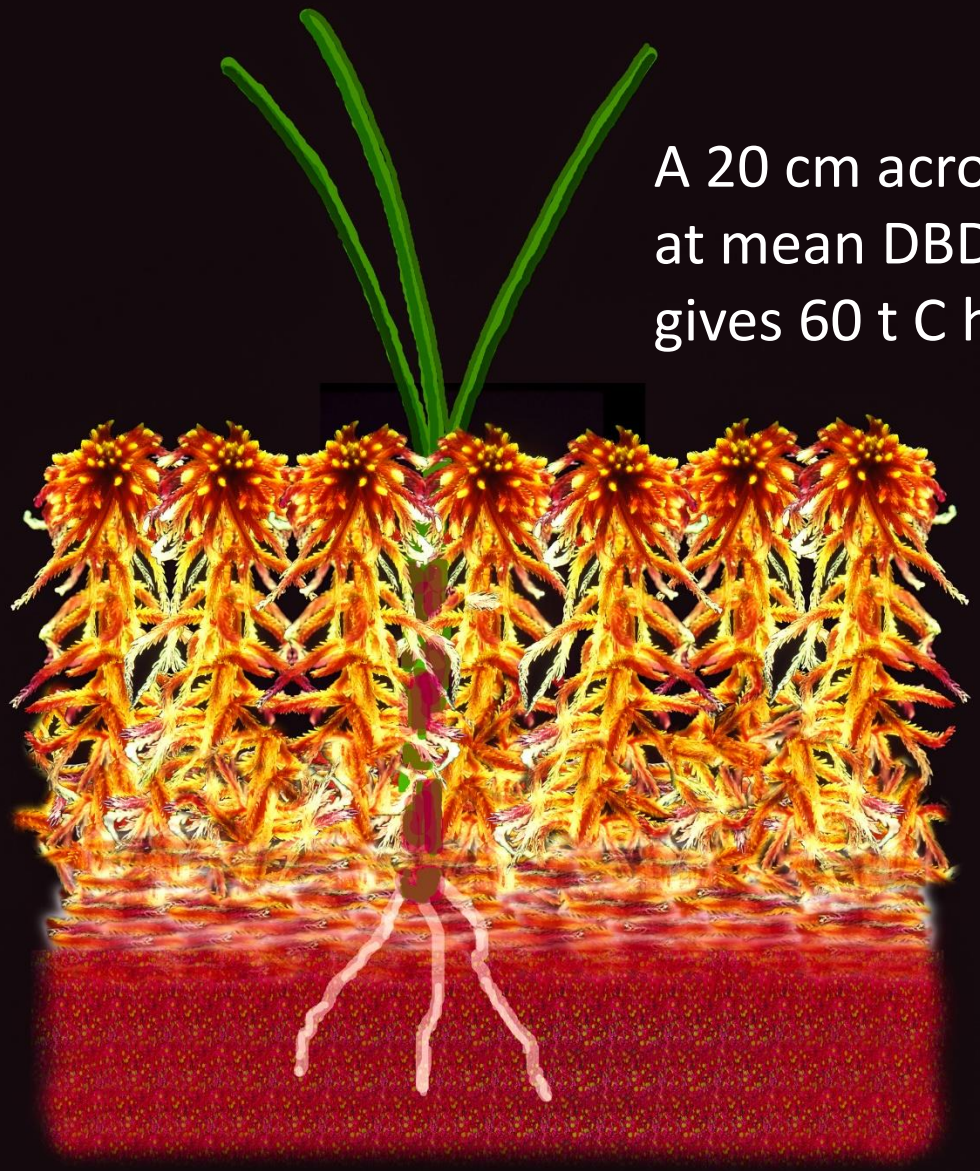

A 20 cm acrotelm
at mean DBD of 0.07 g cm^3
gives 60 t C ha^{-1}

Ecological Engineering 55 (2013) 73–81

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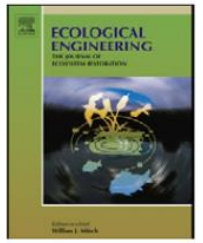

The hydrology of the Bois-des-Bel bog peatland restoration: 10 years post-restoration

Colin P.R. McCarter*, Jonathan S. Price

Department of Geography and Environmental Management, University of Waterloo, 200 University Avenue West, Waterloo, Ontario, Canada N2L 3G1

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ABSTRACT

Restoration measures (ditch blocking, bund construction, etc.) were applied to a cutover part of the Bois-des-Bel (BdB) bog peatland in autumn 1999; since then a near complete cover of *Sphagnum rubellum* (~15 cm) has developed over the old cutover peat, along with a suite of bog vegetation. This research assesses the restored site's (RES) hydrological condition after 10 growing seasons (May 15th–August 15th, 2010) through comparison with an adjacent unrestored site (UNR) and a natural site (NAT) located elsewhere in the peatland. Evapotranspiration (ET) from RES (242 mm) has not noticeably changed since the first 3 years post-restoration (2000–2002) still maintaining lower ET rates than UNR (290 mm). The highest ET occurred at NAT (329 mm), dissimilar to RES despite similar vegetation cover. UNR generates more runoff (37 mm) than RES (7 mm), similar to the initial assessments. However, since the initial

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Watch Andy's introduction of The Carbon Farmer
from Peat Fest 2020

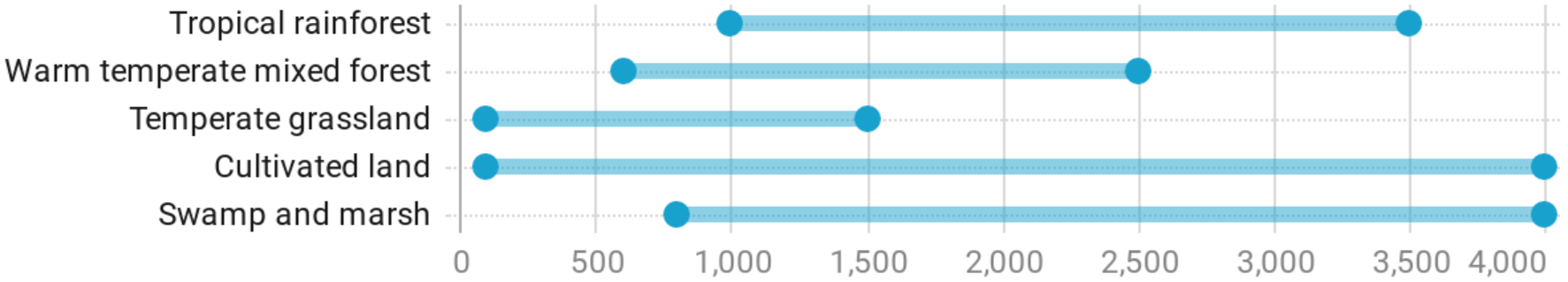
Literature Review: Defra Project SP1218

An assessment of the potential for paludiculture in England and Wales

Authors:

Dr Barry Mulholland, ADAS, Boxworth, UK
Islam Abdel-Aziz, ADAS, Boxworth, UK
Richard Lindsay, Sustainability Research Institute, University of East London, UK
Dr Niall McNamara, UKCEH, Lancaster, UK
Dr Aidan Keith, UKCEH, Lancaster, UK
Professor Susan Page, School of Geography, Geology and the Environment, University of Leicester, UK
Jack Clough, Sustainability Research Institute, University of East London, UK
Ben Freeman, Bangor University, UK
Professor Chris Evans, UKCEH, Bangor, UK

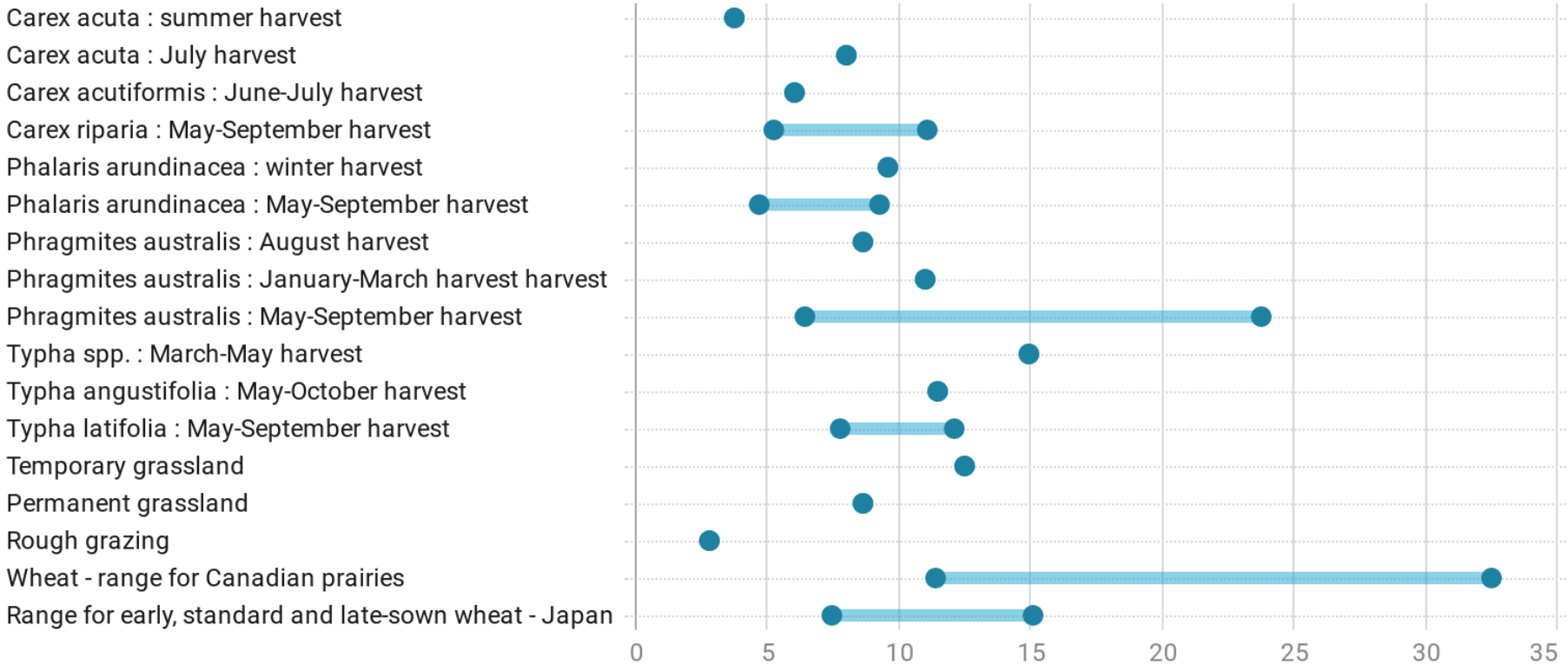
Net primary productivity of selected vegetation types



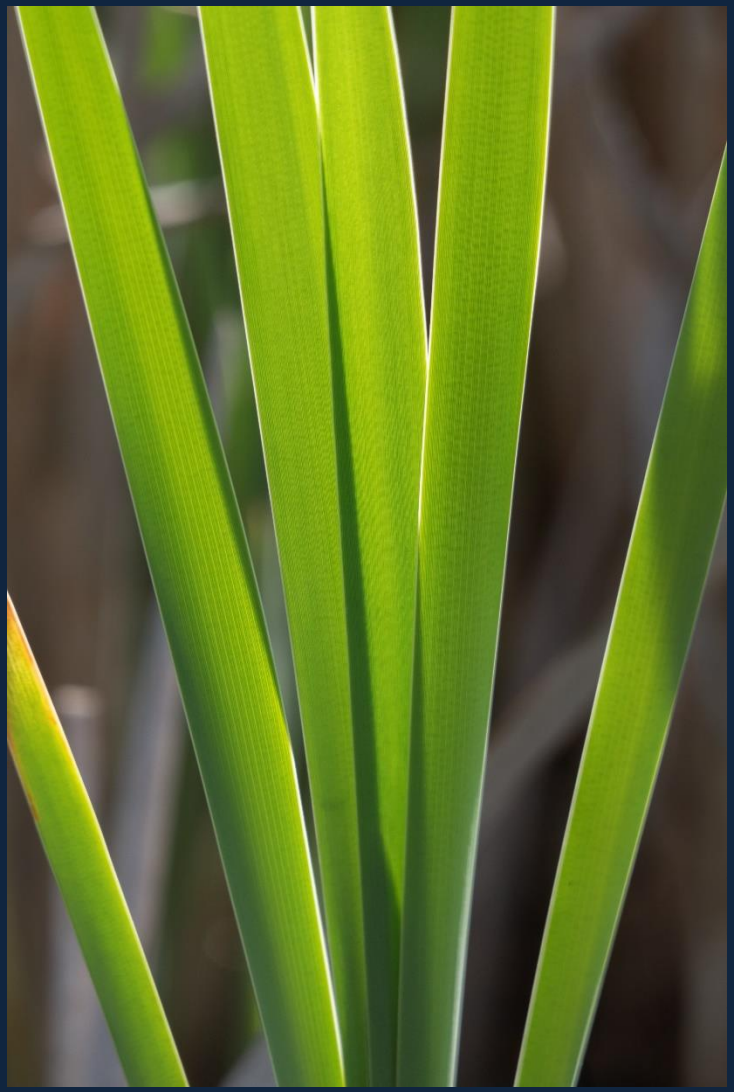
Net primary productivity (g m-2 yr-1)

Source: Williams, 1990a • Created with Datawrapper

Average yields for a range of wetland and agricultural crops (tonnes of dry matter per hectare per year)



Source: Oehmke & Abel, 2016; Qi et al., 2018; Huffman et al., 2015; Saweda et al., 2019 • Created with Datawrapper



Cabbage - Melcourt - 5 weeks after sowing

Control Peat (Levington M2) control

Sphagnum 20%

peat-free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