Climate Change Mitigation – the role of natural habitats

Dr Chris Miller – Mossland Project Manager

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Climate Change

Current Predictions

1.4^{o}C – 6.4^{o}C by 2100

Implications for the UK

Warmer + Drier Summers

Milder + Wetter Winters

Also

Increase in Extreme Weather

Sea Level Rise (0.18 – 0.59 m)

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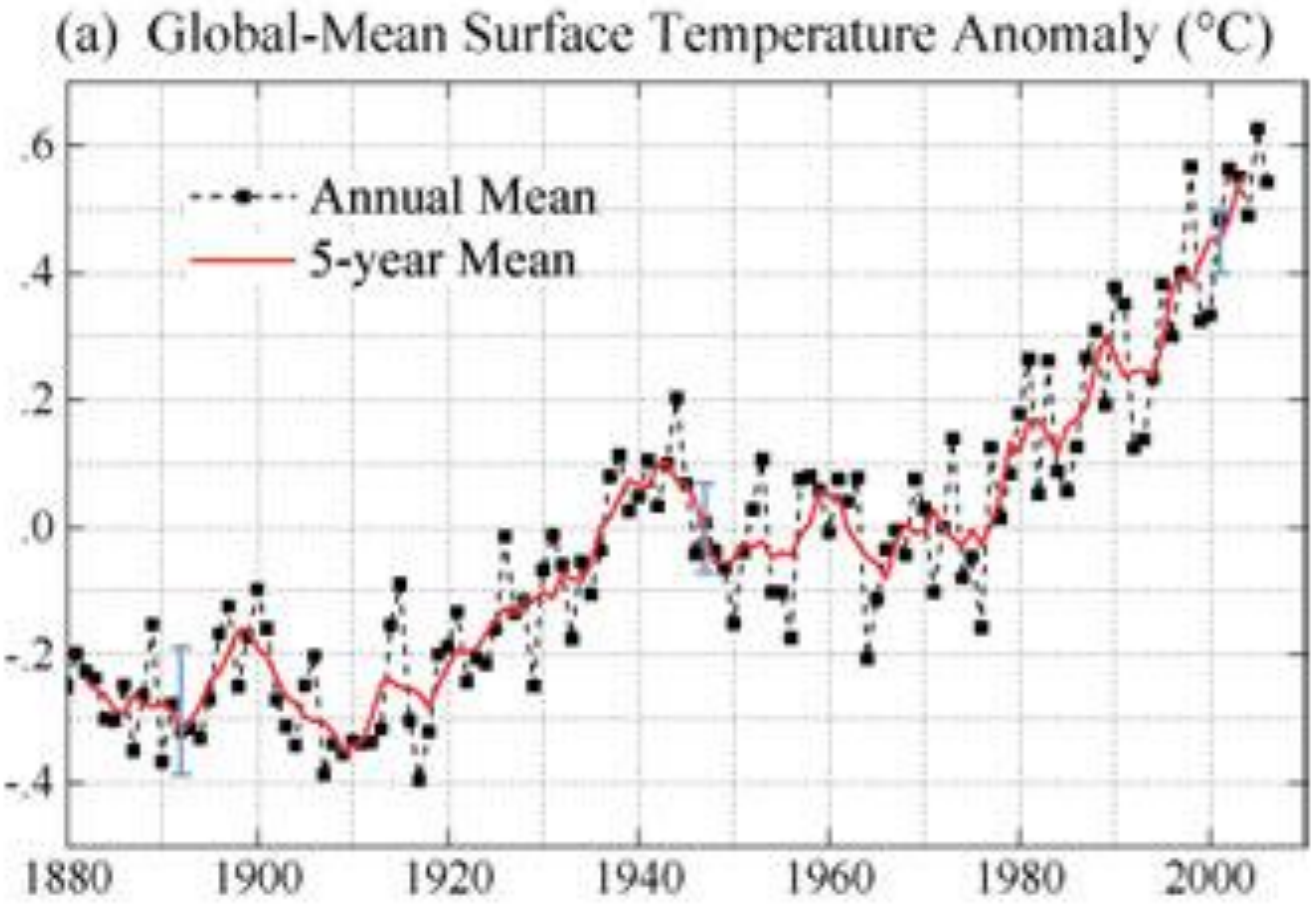
Global Temperature Increase



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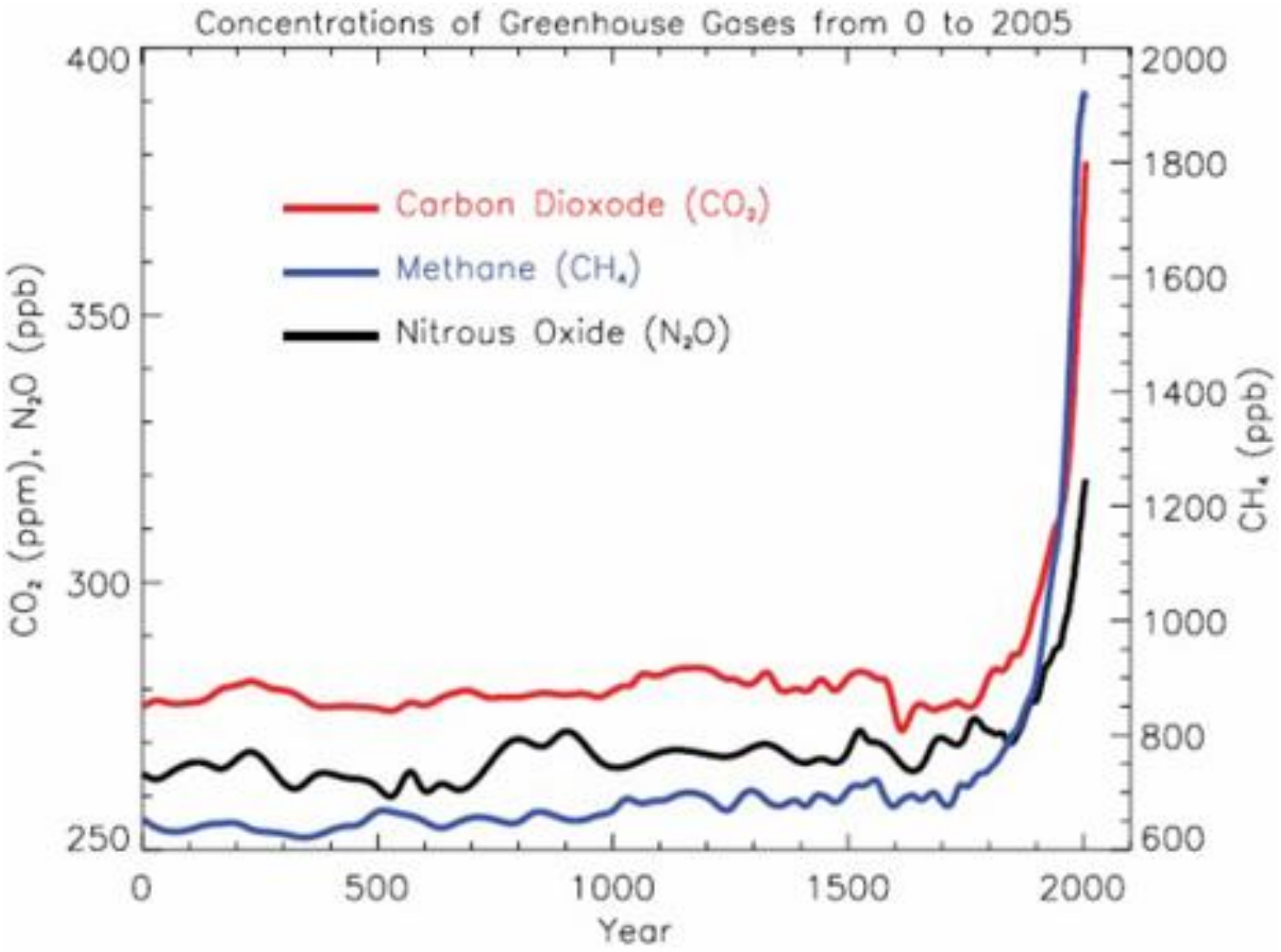
Greenhouse Gas Increase



Impact on Biodiversity

Changes In:

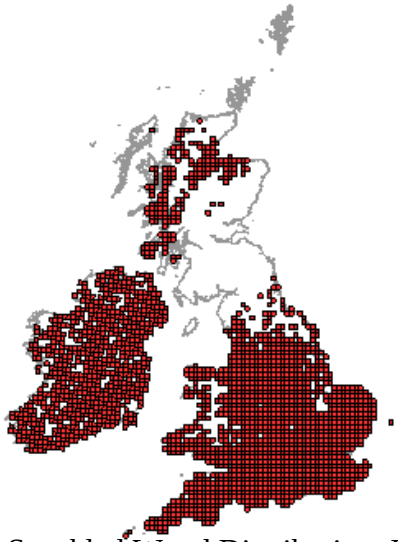
Distribution

Timing of seasonal events

Spread and impact of invasive species and disease

Competitive advantages between species

Winners and losers



Speckled Wood Distribution: UKBMS

Conventional Solutions

Natural Alternative?

Natural Alternatives

Vegetation
Soil
Organic Soils
Peat →

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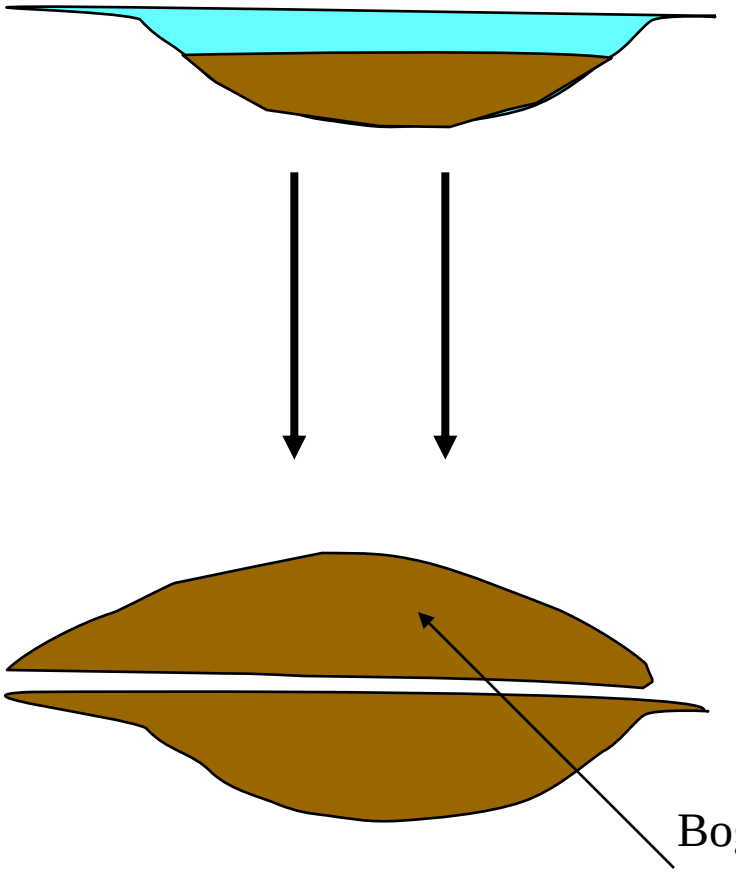
Peat Formation



Terrestrialisation

Palaudification

Net result accumulation of organic material

Increases Acidity

Increases Water Retention

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Peat Extent

3% Worlds Land Surface (4,000,000 km2)

UK – 18,000 km2

8.5 % UK land area

Carbon Stored

World - 455 billion tons of carbon

Great Britain – 5071 million tonnes of carbon

Equivalent to 35 years U.K. emissions

UK Peat - 2512 tonnes/ha

Taigas and steppes – 200-250 tonnes/ha

Tropical rain forests – 100 tonnes/ha

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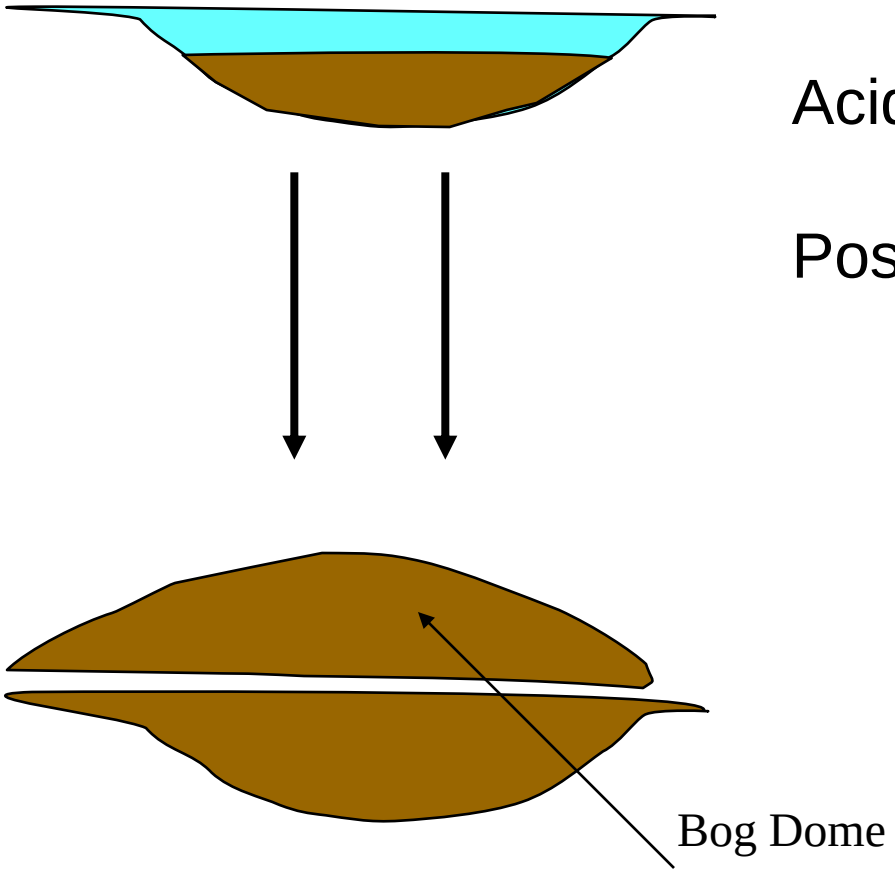
Why does peat store so much carbon?



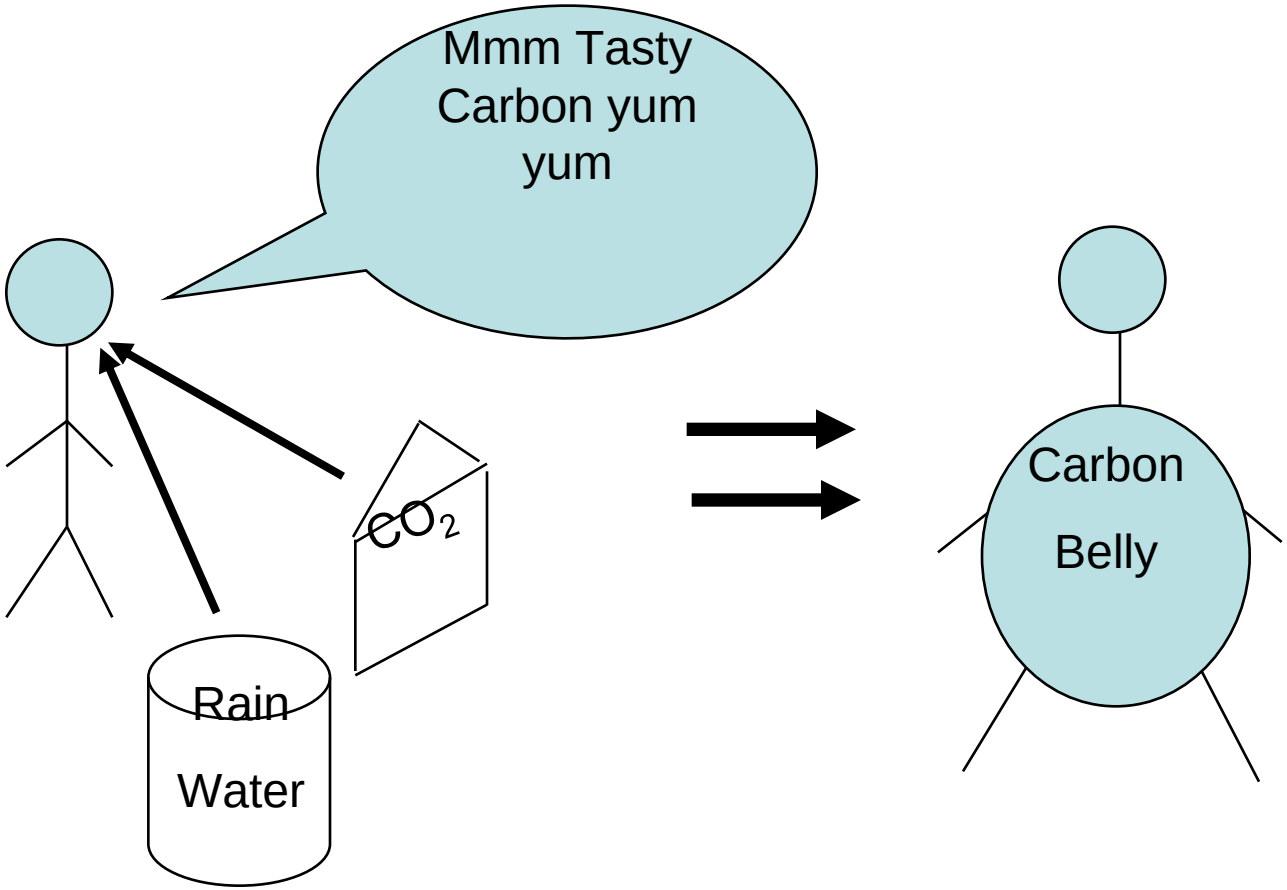
Waterlogged

Acidic

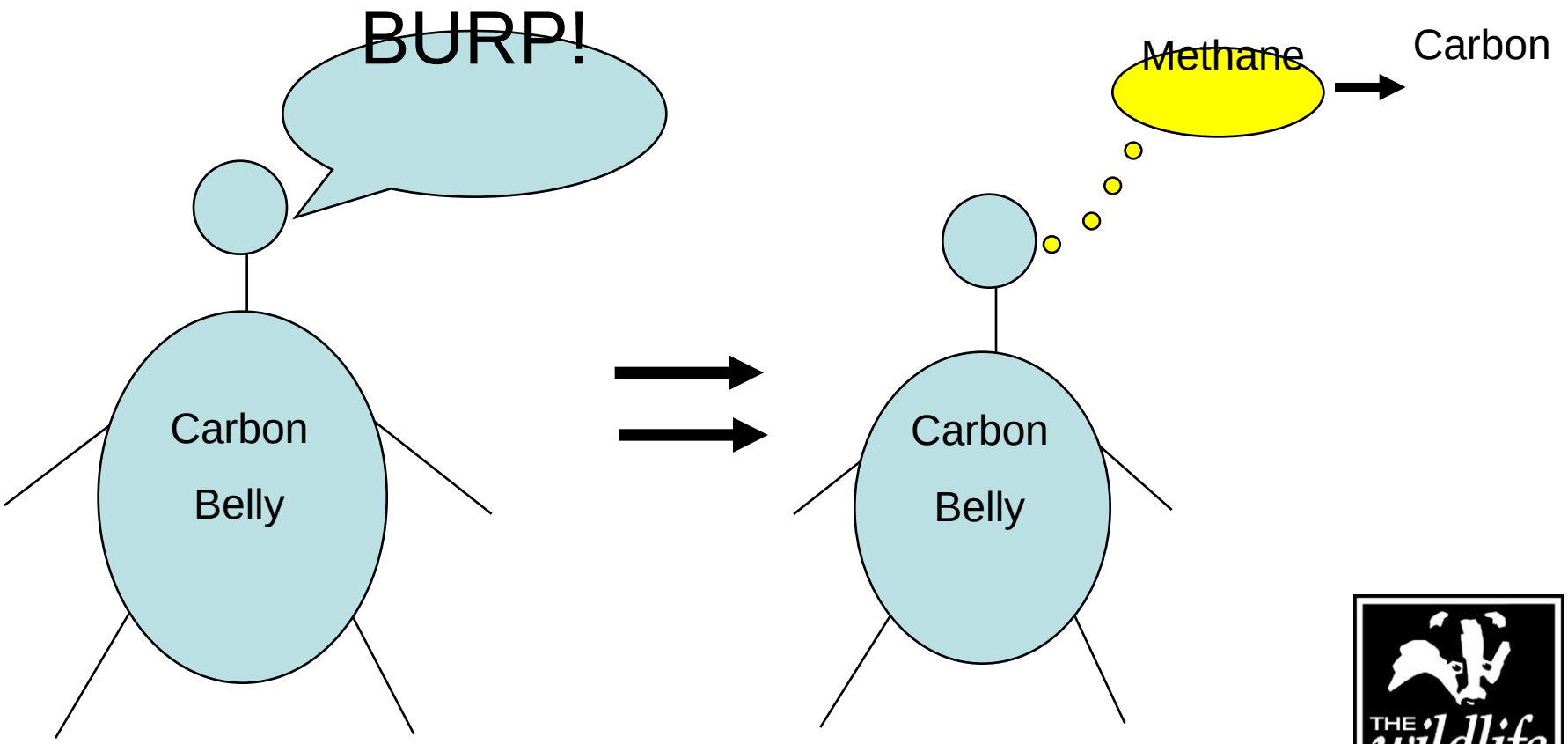
Positive Feedback

Sphagnum

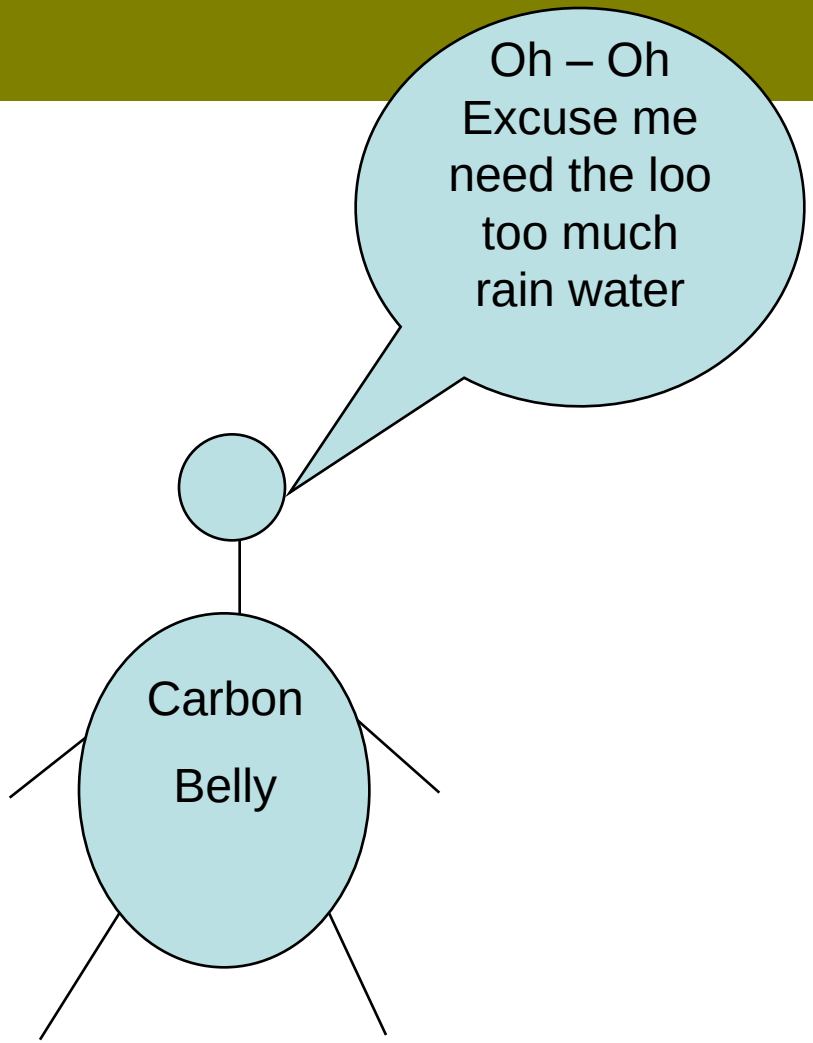
Peat Carbon Dynamics I



Peat Carbon Dynamics II



Peat Carbon Dynamics III



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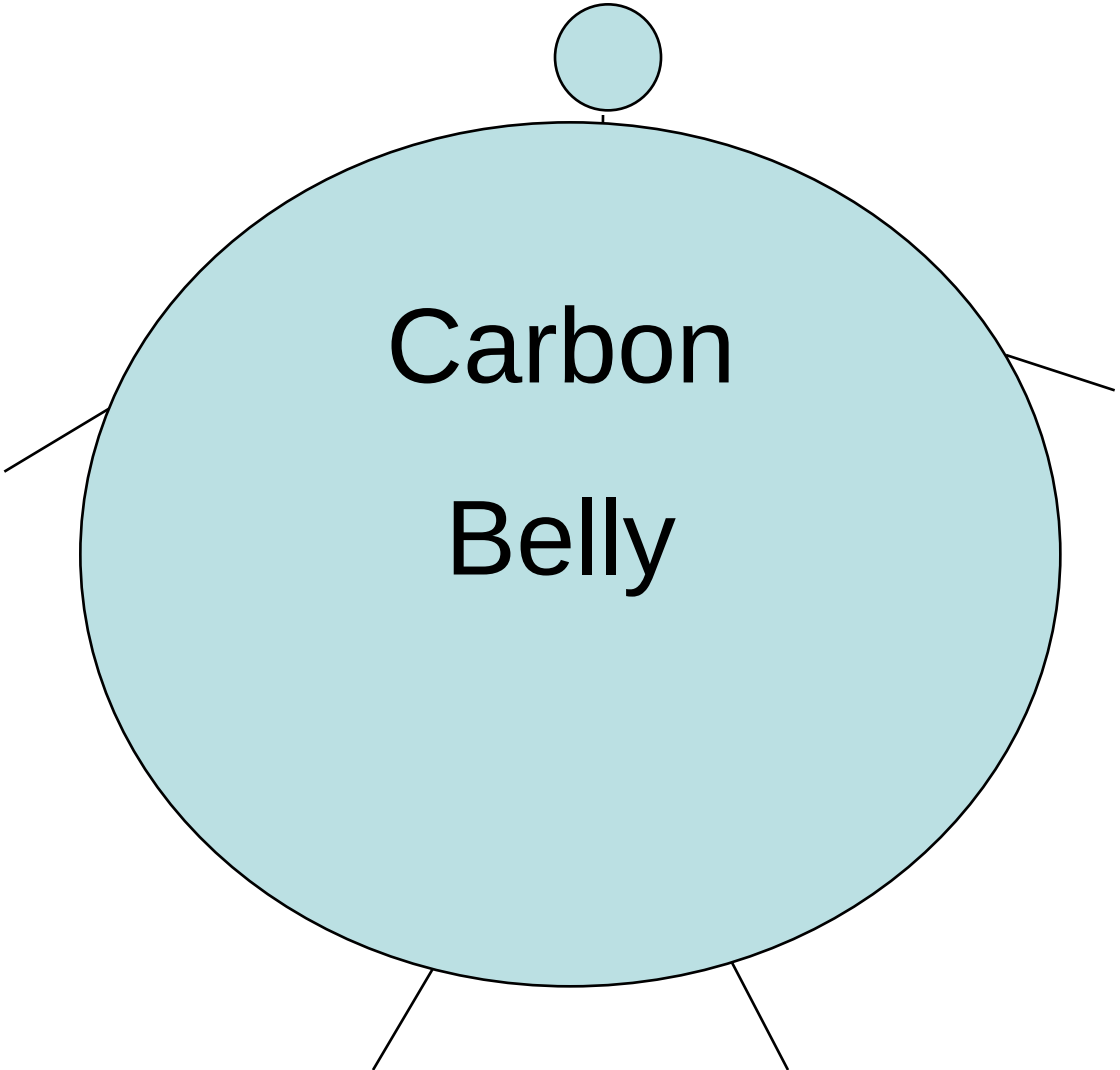
Peat Carbon Dynamics IV



Peat Carbon Dynamics V

Vegetation Stores Carbon – slowly decays

Water logging minimises CO_2 release

Some Methane release

Dissolved organic carbon release

- Water Colour

No/little Nitrous oxide as nutrient poor

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Conservation Importance

UK Priority BAP Habitat

European Habitats Directive:

*"All areas of **cutover peat capable of restoration** to **mossland within 30 years** should be considered as of European Importance."*

10,000 year old habitat

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Wildlife on Mosslands

Habitat Under Threat

Peat Extraction

Forestry

Agriculture

Over Grazing

Lost two thirds of lowland raised bog

Upland blanket bog threatened

- Eroding rapidly

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Carbon Released Per Year

Habitat/Land Use	Tonnes CO_2 eq/ha/y
Wet Bog	-2.8 (-7.2 → 5.9)
Dry Bog	14 → 28
Peat Extraction	600
Agriculture on peat	14 → 26
Forestry on peat	-4.78 → 0.77

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Peat Extraction

U.K. 9000 ha

4-12 million tonnes of CO_2 per year

Does not include imports

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Take Home Message

Peat store vast quantities of carbon

Habitat under threat

Valuable for biodiversity

Manage a relatively small area get huge carbon returns

Don’t buy peat!

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Thank you For Your Attention

Global Warming Potentials

	Lifespan (Years)	20 Year	100 Year	500 Year
Carbon Dioxide	-	1	1	1
Methane	12	72	25	7.6
Nitrous Oxide	114	289	298	153

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